6B

Information/Action

Professional Services Committee

Initial Accreditation and Program Approval

Executive Summary: This agenda item presents proposals submitted by local education agencies and institutions of higher education for single subject matter preparation program approval and guidelines-based Alternative Professional Clear Administrative Services Credential program approval. The agenda item provides an overview of the process for reviewing proposals, information about the program proposals, costs associated with the reviews, and options for Commission action.

Recommended Action: That the Commission act on the Single Subject Matter Preparation Programs in Industrial and Technology Education and the guidelines-based programs for the Professional Clear Administrative Services Credential.

Presenters: Lawrence Birch, Administrator, and Helen Hawley, Consultant, Professional Services Division.

Strategic Plan Goal: 1

Promote educational excellence through the preparation and certification of professional educators

- ♦ Sustain high quality standards for the preparation of professional educators.
- ♦ Assess and monitor the efficacy of the Accreditation System, Examination System, and State and Federal Funded Programs.

Initial Accreditation and Program Approval

Introduction

This agenda item presents proposals submitted by local education agencies and institutions of higher education for single subject matter preparation program approval and guidelines-based Alternative Professional Clear Administrative Services Credential program approval. The agenda item provides an overview of the process for reviewing proposals, information about the program proposals, costs associated with the reviews, and options for Commission action.

For the May-June meeting of the Commission, there are two subject matter preparation programs for consideration. Education Code §44259 charges the Commission with the responsibility for ensuring that subject matter standards and examinations are aligned with the state content and performance standards for pupils. Education Code §44311 requires the Commission to evaluate any subject matter program offered by an accredited institution. In carrying out these responsibilities, the Commission grants approval to subject matter programs. There are three guidelines-based programs for the Professional Administrative Services Credential presented for consideration. When the Commission adopted the standards and the guidelines for the Professional Administrative Services Credential program, it required that the guidelines-based programs be approved by the Commission.

I. Approval of Subject Matter Preparation Programs

At the April 2005 Commission meeting, information was provided for the Commission on the review and approval of subject matter preparation programs. Program sponsors who have already received initial institutional accreditation are eligible to submit new programs of subject matter preparation for review and approval. Under the *Accreditation Framework* in 1995, the Committee on Accreditation was given initial program accreditation responsibilities for the professional preparation programs included in the ongoing accreditation site visit process. All other types of program approval remained with the Commission. Thus, the results of the program review of a professional preparation program are submitted to the Committee on Accreditation for program accreditation according to the *Accreditation Framework* (Section 2 A 2). Other programs, including subject matter preparation programs are submitted to the Commission for approval. In either case, the review process is the same. The difference is in the body making the final decision to approve the program.

Subject Matter Program Review Procedures

Following are the general procedures for the review of new subject matter programs:

1. Technical Assistance – After the Commission adopts a set of new program standards, Commission staff members provide technical assistance to sponsors wishing to submit responses to the new standards. The technical assistance may take several forms. Staff members may arrange meetings of prospective sponsors to discuss the standards and how to respond to them. Staff members respond to questions from sponsors in e-mails and telephone calls. Occasionally, staff members will provide an informal review of one or more written responses to standards. Finally, technical assistance materials are provided on the Commission's website.

2. Preconditions Review – After the program proposal is received, Commission staff members review the sponsor's response to the preconditions. The preconditions are based on state laws and Commission policies and do not involve issues of program quality but do address minimum unit and content area requirements. Staff reviews the proposed program to determine that it complies with the requirements of state laws and Commission policies. If the preconditions response is incomplete, the sponsor is requested to provide specific information necessary for compliance with the preconditions. The sponsor may submit the information requested or resubmit the entire proposal with the inclusion of the requested information.

3. Program Review – In addition to the preconditions review, the program sponsor's responses to the credential program standards for the program submitted are reviewed. Unlike the preconditions, the standards address issues of program quality and effectiveness. Each response to the standards is reviewed by Commission staff and/or external volunteer K-12 or postsecondary educators expert in the field of preparation to determine the sufficiency of the responses. Reviewers are trained in the standards and the review process and then assigned proposals to review. If the program does not meet the standards, the sponsor is given an explanation of the findings. The sponsor may then submit the information requested or resubmit the entire proposal with the inclusion of the requested information. Once the reviewers determine that the program proposal meets the Commission's program standards, the program is brought to the Commission for program approval.

4. Once subject matter program approval is granted, the institution may advertise that fact. Graduates of a Commission-approved single subject matter preparation program meet the Commission's subject matter program requirement and are not required to take the subject matter examination (CSET).

Fiscal Considerations of the Subject Matter Program Review Process

The costs of reviewing a prospective subject matter program for initial approval vary. Before a proposal is submitted for review, there may be consultation with one or more Commission staff

members. Typically, the consultation might be one to two hours in length. Once the proposal is submitted, staff review is conducted to see if it is complete, if responses to the required preconditions and standards are satisfactory, and if appropriate supporting evidence is included. If the response is incomplete, the prospective sponsor is notified and given the opportunity to submit additional information. Depending on the thoroughness of the submission, the preconditions review could take as little as one hour of staff time. The full review of a program proposal could take from four to eight hours to review the responses to the standards per reviewer. Again, if the response to the preconditions or standards is deficient, the time necessary to complete the review could increase. Each review requires at least two volunteer reviewers to reach consensus about the response of the program sponsor. Reviewers communicate by a secure web-based communication system or telephone about the results of their individual reviews and come to agreement about the specific review. If reviewers cannot agree upon the program report, another reviewer and/or staff interact with the original reviewers to come to agreement about the response.

Programs Submitted for Consideration

There are two programs proposals submitted for consideration of Initial Subject Matter Preparation Program Approval: These programs were reviewed against standards contained in the *Industrial and Technology Education Teacher Preparation in California: Standards of Quality and Effectiveness for Subject Matter Programs* adopted by the Commission in 1996 (Appendix D)

Request for Initial Subject Matter Preparation Program Approval from California State University, Los Angeles for Industrial and Technology Education

The stated philosophy and purpose of the California State University, Los Angeles (Appendix A) program is "To provide well-prepared Industrial and Technology Education teachers for the varied needs of all schools in California. Every teacher will be prepared to teach in a variety of settings to culturally diverse students, and maintain a degree of flexibility that will enable each to adapt to evolutionary changes in the discipline." To make that possible, the program of study in Industrial and Technology Education addresses the following goals. These goals also function as the program outcomes set forth in our program assessment process.

1.   Critical Thinking Skills – The ability to ask "what-if" questions and to debate the relative merits, costs (social and economic), and long-term effects of multiple solutions to problems.

2.   Open-ended Problem Solving – Presenting students with problems that have multiple solutions. Some solutions may be better than others, but there is no single, "right" answer.

3.   Active Learning – Learning by doing rather than only hearing or reading about the subject. Formerly referred to as "hands-on" instruction.

4. Cooperative (Team-Based) Learning – Providing students with assignments that are completed by a team, rather than an individual. The teams require interdependency, since job specialization challenges each student to perform a portion of the task. Goals One through Four tend to work in concert, with student teams working on solutions to problems in an active learning environment, involving critical thinking and multiple solutions.

5. A Broad Technical Base – Provided by a dual core program, one addressing the theoretical knowledge base of our discipline, the other providing a technical base. Students learn about the field of technology in the broadest possible context.

6. An Advanced Technical Specialization – Students exit the program with a specialization or concentration that endows each with "expert" status. They have in-depth knowledge and abilities in that field.

7. Written and Verbal Communications – Each student will be able to communicate effectively, verbally and in writing, at the conclusion of this program. Communication is also broadly defined to include the modern forms of electronic communications.

8. A Specialized Understanding of Teaching in I&TE – Students will understand the history, development, philosophy, operation, and direction of I&TE in California. They will have a command of the various permutations of programs in our field, and be able to present an unbiased assessment of each.

The sum total of these attributes combine to produce neither an industrial arts teacher **nor** a technology teacher, but an Industrial and Technology Education teacher prepared to instruct in all known formats used today, as well as develop and lead the discipline into future approaches.

Request for Initial Subject Matter Preparation Program Approval from California State University, Fresno for Industrial and Technology Education

The stated purpose of the California State University, Fresno Subject Matter Program in Industrial and Technology Education (Appendix D) is to prepare competent secondary teachers. Their primary responsibility will be to teach relevant technologies and skills to culturally diverse secondary school students whose future success will be highly dependent upon their ability to understand and apply appropriate technologies used typically by the industrial sectors in a rapidly changing and diverse society. Special attention will be placed on teaching strong fundamentals that will allow all students to succeed academically and excel in the areas of their personal interests. The program strives to instill in students the notion that education is a continuous path to improvement.

The program goals are:

1. To provide students with professional knowledge, skills and technical competencies needed to effectively teach in secondary Industrial and Technology Education programs.

2. To develop a fundamental understanding of the impact of technology on society—past, present and future.

3. To provide an environment where students will learn and apply problem solving skills.

4. To provide an environment where students can develop/enhance communication skills that will aid in the development of effective leadership in a diverse educational community.

5. To develop in each prospective teacher competency in at least tow program concentrations identified by the approved subject matter program and selected by each candidate.

Review of Institutional Proposals

California State University, Los Angeles and California State University, Fresno have submitted complete responses to the Commission's Preconditions and *Standards of Quality and Effectiveness for Single Subject Matter Preparation Programs in Industrial and Technology Education* (Appendix D). The responses to the preconditions were reviewed by Commission staff and are judged to be met. The responses to the standards were reviewed by a subject matter review panel and are judged to be met. Based on the satisfactory review of responses to Preconditions and Standards, it is appropriate to bring these two programs to the Commission for consideration.

II. Approval of Guidelines-Based Programs for the Alternative Professional Clear Administrative Services Credential

Background

California's school administrator credential structure consists of two levels of certification. The first level, the Preliminary Administrative Services Credential, requires the candidate to verify three years of successful school experience, possess a teaching credential or other services credential (e.g., counseling credential), and to complete a Commission-accredited formal administrator preparation program or to verify administrative knowledge by passing a Commission-adopted examination. The Preliminary Administrative Credential is valid for five years. During this first five years of service, the administrator is required to complete advanced certification requirements in order to qualify for the permanent California administrator license, the Professional Clear Administrative Services Credential.

In response to concerns stated in the field about the effectiveness and utility of programs leading to the professional clear credential, the Commission reviewed program standards and requirements in 2001 and 2002 and solicited input from California administrators about their experiences in completing credential requirements. From this information the Commission concluded that there needed to be greater flexibility in options and requirements for new administrators to obtain the professional clear credential. The Commission also determined that one or more options needed to emphasize mentoring from an experienced administrator rather than formal preparation in order to make the advanced preparation experience most effective for new administrators. Consequently the Commission acted to establish a variety of options from which a new administrator could select to meet requirements for the professional clear credential.

Guidelines-based professional clear administrative services credential programs are one of five options provided to new school administrators for meeting requirements for the Professional Clear Administrative Services Credential. The Commission established this option in November, 2003, as the last of several measures aimed at reforming advanced California school administrator preparation. The other four options available under current law are:

1. ***Completion of a standards-based professional clear administrative services credential program*** – These programs are offered by colleges, universities and county offices of education. Such programs consist of a combination of coursework and fieldwork experiences and are reviewed under the Commission's formal program accreditation process. Virtually all administrators completed this route after the state instituted a two-level administrative credential structure and prior to the Commission's most recent reform efforts.

2. ***Demonstrated mastery of fieldwork performance standards*** – This option is an extension of the authority of the standards-based programs described above, allowing institutions with those programs to assess program candidates on their current administrative performance, and to clear any or all program coursework requirements based on the findings of that assessment. This option is intended to allow institutions to abbreviate programs for some candidates based on a determination that a candidate has already been able to demonstrate competence in one or more aspects of the professional clear credential program. Only those aspects in which the candidate has demonstrated competence are to be cleared under this option, and all of the other program requirements must be completed before the candidate is to be recommended for the professional clear credential.

3. ***Completion of the AB 75 Principal Training Program offered by a state-approved provider*** – The Commission acted to recognize completion of all three modules of the Principal Training Program as an option for meeting the advanced preparation requirement for the professional clear credential. These programs are reviewed and approved by the State Board of Education with assistance by staff of the California Department of Education. Due to a requirement for some administrators to complete this program, as well as the availability of state funds to cover administrators' costs for participation in many cases, this has become a popular option for meeting requirements for the professional clear credential.

4. ***Passage of a national administrator performance assessment adopted by the Commission*** – Legislation reflecting the Commission's policy for administrator preparation reform included establishing an examination option for meeting requirements for the professional clear credential. At the time this legislation passed, Commission staff had identified a portfolio-based assessment being developed based on national administrator performance standards that are closely aligned with California's administrator performance standards, and had intended to propose that assessment to the Commission for possible adoption to serve as this option. Due to a dispute over ownership of the portfolio assessment among the entities involved in its development it has not yet become available for use. Staff has not found an acceptable alternative, so this option is not currently available.

The fifth option, guidelines-based professional clear administrative services credential programs, focuses on providing individualized support, mentoring and assistance to new administrators. These programs are required to initially assess candidates on their early administrative performance, thereby identifying relative strengths and weaknesses and establishing appropriate professional development goals. Based on the initial assessment the candidate, program faculty and an experienced administrator who will serve as the candidate's mentor develop a mentoring plan that defines the focus, goals, mode and frequency of mentoring activities and may identify specific professional development activities that the candidate will complete over the course of the program. Program guidelines for this option require that candidates receive a minimum of two years of mentoring prior to being recommended for the professional clear credential. The candidate's administrative performance and progress toward program goals must be assessed on multiple occasions, and the mentoring plan may be amended over time to reflect changing candidate needs and/or job responsibilities. The program design must also include a summative assessment through which the candidate must be judged to have attained a level of administrative competence meriting recommendation for the Professional Clear Administrative Services Credential. Programs approved under this option are granted authority to recommend program candidates for the credential based on a positive summative assessment.

Guidelines-based Program Review Procedures

The Commission's adoption of program guidelines to govern program review and approval represents a departure from the Commission's conventional program approval process. Under the conventional process, programs are proposed and reviewed according to formal program standards, preconditions, and the Common Standards adopted by the Commission, and the decision on program accreditation rests with the Committee on Accreditation. Due to the alternative approach of guidelines-based programs, the Commission opted to institute a different program approval process. At its November 2003 meeting, concurrent with adoption of the guidelines that govern these programs, the Commission adopted the following process for review and approval of guidelines-based professional clear administrative services credential programs.

1. An entity interested in sponsoring a program prepares a program proposal that addresses each of the Guidelines for Alternative Professional Clear Administrative Services Credential Programs, and the related expectations.

2. Before the proposed program is submitted to the Commission, it receives written approval by the individual or group responsible for governance of the entity sponsoring the program. The written approval accompanies the program proposal when the proposal is submitted to the Commission for review and approval.

3. Commission staff reviews the proposed program to determine whether the proposal complies with the Commission's adopted guidelines and expectations for such programs, and may request additional information or clarification from the program sponsor to be satisfied that all guidelines and expectations are met.

4. Upon a finding that the proposed program meets all program guidelines and expectations, staff recommends program approval to the Commission and places the proposed program on the appropriate agenda for formal approval.

5. Once formally approved, the program may be implemented by the program sponsor, and an individual identified as having completed the approved program will be recognized as having completed the requirements for the Professional Clear Administrative Services Credential. The program sponsor will complete a program completion verification document produced by the Commission, and provide this document to the administrator completing the program for use in applying for the Professional Clear Administrative Services Credential.

Based on this program review structure, Commission staff has previously reviewed four guidelines-based professional clear administrative services credential programs and the Commission has formally approved those programs, which are now in operation. This item presents three additional proposed guidelines-based programs. Staff has found that each program proposal has received appropriate endorsement from the sponsoring agency's governance, and that each program as proposed meets the Commission's guidelines for such programs. A brief description of each program follows.

Fiscal Considerations of the Guidelines-Based Program Review Process

The costs of reviewing a prospective program for guidelines-based approval will vary. Before a proposal is submitted for review, there may be consultation with one or more Commission staff members. Typically, the consultation might be one to two hours in length. Once the proposal is submitted, staff review is conducted to see if responses to the required guidelines are satisfactory, and if appropriate supporting evidence is included. If the response is incomplete, the prospective sponsor is notified and given the opportunity to submit additional information. Depending on the thoroughness of the submission, the time necessary for review of a program proposal could take from four to eight hours. Again, if the response to the guidelines is deficient, the time necessary to complete the review could increase.

Programs Submitted for Consideration

There are three programs proposals submitted for consideration of Alternative Professional Clear Administrative Services Credential Program Approval. These programs were reviewed

according to the *Program Provider Guidelines for Alternative Professional Clear Administrative Services Credential Programs* adopted by the Commission in 2004 (Appendix C)

San Diego County Office of Education Alternative Professional Clear Administrative Services Credential Program

The San Diego County Office of Education (SDCOE) provides a variety of educator support services and professional development activities for school districts in its service area. The proposed program is to be housed in the Learning Resources and Educational Technology (LRET) Division of SDCOE, which currently offers an array of professional development opportunities for school administrators, including the AB 75 Principal Training Program and the California School Leadership Academy. LRET also provides access to content experts in all core subject areas, technology resources, and experts in assessment and data analysis knowledgeable in key areas such as California state testing programs and the Academic Performance Index. The program proposal indicates that administrators involved in the program will be allowed to benefit from all resources and services of the division.

The design of the proposed program follows the general model set forth in the Commission's guidelines. Upon the approval of a candidate's application for participation, representatives of the program sponsor and the candidate's employer meet with the candidate to clarify program requirements, discuss initial candidate assessment, and begin to develop an individualized *Mentor Plan* based on the candidate's identified strengths and weaknesses. Through an initial assessment process the candidate is assessed according to 14 program objective areas identified in the proposal. These objective areas include the California Professional Standards for Educational Leaders (CPSEL), augmented by other administrator performance standards garnered through discussions with school personnel from around the county. This initial assessment process includes an assessment according to the objectives by the candidate's assigned mentor, and a similar self-assessment completed by the candidate. The results of this assessment form the basis for establishing individualized program objectives for the candidate that are designed to address the candidate's weaknesses and improve the candidate's administrative performance. Specific learning activities intended to address the candidate's needs, as well as plans for mentor/candidate meetings are identified in the *Mentor Plan*. The program proposes a standard of five individualized professional development goals for each candidate in each semester of the program, with a minimum of 40 hours of professional development activities to meet those goals. (Specific professional development activities vary based on individual candidates' needs.) The program has established qualifications for mentors that require significant successful administrative experience, experience in educator training and support, a disposition conducive to success as a mentor, a recommendation from the mentor's employer, and approval from the program sponsor. Mentors are trained using "Coaching Leaders to Attain Student Success" (CLASS), an administrator mentor training program developed by the University of California, Santa Cruz. Mentors meet with their candidates at least once every two weeks to discuss the candidate's concerns and to monitor the candidate's progress toward the candidate's professional development goals. A program faculty representative meets with the candidate at least once a month for similar purposes. The candidate, lead mentor, and program sponsor meet quarterly to discuss the candidate's progress and effectiveness of professional

development activities to date. The candidate is reassessed according to the program objectives and receives written feedback on four additional occasions: at the middle and at the end of each of the two years in the program. As professional development goals are achieved they are replaced by newly-identified goals. The *Mentor Plan* may also be amended for other purposes as needed upon agreement between the candidate, mentor, and program sponsor. At the end of the two-year program the candidate is given a culminating assessment that includes a final performance assessment according to the 14 program objectives, a review of the *Mentor Plan* goals and activities and the candidate's progress in completing the plan. The mentor and the program sponsor conduct a final meeting to review the documentation and determine whether the candidate has reached a level of competence meriting possession of the professional clear credential.

This proposal includes appropriate program documents and forms to be used for assessing the candidate, the mentor, and the program. The proposal complies with requirements in the guidelines for both internal and statewide program review of program quality that both inform the program about ways in which the program may be further refined, and assist staff in determining whether continued program approval is merited.

California Educational Leadership Alliance

The California Educational Leadership Alliance (CELA) is a recently-formed California corporation, "dedicated to supporting and developing strong leadership in our schools". The program is located in the San Bernardino area, and the proposal indicates that they initially plan to serve approximately 30 new administrators in the program's service area, within 50 miles of the program office. CELA is led by a team of five experienced California administrators who average over 20 years of school experience in a variety of capacities including teacher, program coordinator, site principal, faculty support director, district program director, assistant superintendent, district superintendent, and school board member. Combined personal administrative experience and past experience in providing support and professional development for other administrators led the team to develop and propose this program to address the mentoring needs of new administrators in CELA's service area.

The design of this proposed program also follows the general model set forth in the Commission's guidelines. Based on an initial assessment of the candidate's strengths and weaknesses, the candidate, mentor and a program representative meet to develop a *Candidate Growth Plan* that establishes professional development goals intended to address the candidate's developmental needs. Both the initial and subsequent quarterly assessments are based on the CPSEL. Candidates' professional growth activities generally include a series of seminars on faculty capacity building and effective instructional leadership developed by CELA faculty. The program proposal indicates that these seminars contributed to improved student performance when previously used for administrator in-service training in a California school district. The seminars may be substituted or augmented by other professional development activities if the alternate activities are determined to appropriately address a candidate's professional development needs as determined by the candidate, mentor and program representative. In addition to the quarterly performance assessments, each candidate completes a *Digital*

Assessment Portfolio that tracks the various program goals, activities and assessments, as well as other artifacts created during the course of the program that demonstrate the candidate's progress toward meeting identified professional development goals. Mentors are expected to meet with their candidates between three and six hours per month, and mentors are to track the frequency and duration of their meetings with candidates in a coaching log developed by the program. The program's qualification requirements for mentors include significant successful administrative experience, professional references, approval of the program director and program governance panel, and completion of mentor training offered by the program. CELA's *Quality Control Mentor Training* is intended to ensure that mentors have current knowledge of education issues affecting administrators and state and program performance expectations for school leaders. The proposal indicates that the training borrows from UC Santa Cruz's CLASS training, as well as Marilyn Tabor's "Coaching for Success". The program proposal indicates that CELA plans to primarily recruit recently retired administrators to serve as mentors. Mentors are to review candidate progress toward objectives identified in the *Candidate Growth Plan* at each meeting with the candidate, and more formally at least once per quarter. The plan may be amended to reflect changing candidate needs or job responsibilities upon consensus of the candidate, mentor, and Program Director. Candidates are formally evaluated each quarter and receive feedback about their progress toward completing the *Candidate Growth Plan* after each evaluation. At the end of the second year of the program, the candidate and mentor review the goals established in the *Candidate Growth Plan* to verify that all goals have been met. The candidate's administrative performance is also generally evaluated, and the mentor must rate the candidate in the "always" or "consistently" categories of the evaluation rubric mentors are required to use in candidate assessment. The Program director reviews the candidate's *Digital Assessment Portfolio* and the candidate evaluations completed by the mentor to determine if there is sufficient evidence of candidate competence to merit recommendation for the Professional Clear Administrative Services Credential.

This proposal includes appropriate program documents and forms to be used for assessing the candidate, the mentor, and the program. The proposal complies with requirements in the guidelines for both internal and statewide program review of program quality that both inform the program about ways in which the program may be further refined, and assist staff in determining whether continued program approval is merited.

Azusa Pacific University Guidelines-based Professional Clear Administrative Services Credential Program

Azusa Pacific University (APU) is an educational institution accredited by the Western Association of Schools and Colleges and located in Los Angeles County. The institution has a substantial history of offering credential programs and preparing educators, and currently has Commission-accredited programs in the following areas: multiple subject, single subject, and special education teacher preparation; reading specialist certification; and services credentials in pupil personnel, school nurse, library media, and both preliminary and professional clear administrative services. In response to the Commission's requirement for all institutions to revise their programs to meet new Commission standards or guidelines, APU has opted to

propose a guidelines-based program offering for candidates pursuing the Professional Clear Administrative Services Credential.

APU's Guidelines-based Professional Clear Administrative Services Credential Program is designed to offer candidates support, mentoring and targeted professional development in a university coursework format. Candidates are initially assessed by program faculty using an assessment instrument APU developed based on the CPSEL. Results of the assessment are discussed in a meeting between the candidate, the candidate's mentor, and a program representative. Based on the findings of the assessment, the three parties develop an *Individualized Mentoring Plan* for the candidate that takes into account the candidate's strengths, weaknesses, and current job status to identify appropriate areas in which to focus mentoring and professional development activities, as well as benchmarks for the candidate's success in the program. The candidate, mentor and program representative discuss and agree to the components and goals of the *Individualized Mentoring Plan.* Identified professional development activities are completed in a series of special projects courses. Specific required activities in these courses vary, as each candidate is assigned activities to address individual weaknesses or current job needs. The plan may be amended to address changes in the candidate's job status, job requirements, or changing professional development needs.

The candidate meets with a university representative every six to eight weeks to discuss recent experiences and progress on the plan, and to ensure that the candidate's support and mentoring needs are being addressed. The program design calls for formal candidate/mentor meetings to be held a minimum of once every four weeks, with possible informal meetings and "on-call" availability between these more formal sessions. The proposal states that program faculty and other individuals with expertise in various aspects of school administration are also available to candidates as needed. The program requires its mentors to be employed in the same school district as the candidate and to be serving in an administrative position above that in which the candidate is employed. Mentors must also have previously served in a similar administrative position to the candidate's current position, must provide successful performance evaluations of prior administrative service, and must commit to completing mentor training provided by the university. Through this training, mentors are made familiar with the program's format, responsibilities of both mentors and candidates, and evaluation procedures and criteria, and complete a review of the CPSEL. The primary resource used in the mentor training is the *Induction Handbook,* created by APU specifically for candidates and mentors participating in this program. A program overview, the CPSEL, various program procedures, and evaluation forms and rubrics are all included in the Induction Handbook, which can be referenced by both mentors and candidates over the duration of the program.

In addition to the evaluation components built into the regular mentor/candidate and university/candidate meetings, candidates are required to assemble a program portfolio that includes the candidate's initial assessment document, *Individualized Mentoring Plan*, projects and activities completed in the plan, and ongoing assessment documentation. As candidates complete the projects and activities identified in the plan, they enroll in a summative evaluation course in which they are again assessed on their administrative performance. If this evaluation results in a finding that the candidate's performance does not meet program standards in any area, the *Individualized Mentoring Plan* is augmented with new projects and activities that

address the candidate's area(s) of weakness that the candidate must complete before revisiting the summative assessment process. The candidate's portfolio is also reviewed during the summative evaluation course to ensure that all required activities have been completed and that the candidate has provided evidence of appropriate professional progress over the course of the program. As a final step in program completion the university representative meets with the mentor, the candidate, and other faculty involved in the candidate's program projects and activities to review all evaluation materials and activities to determine if there is sufficient evidence of candidate competence to merit recommendation for the Professional Clear Administrative Services Credential.

This proposal includes appropriate program documents and forms to be used for assessing the candidate, the mentor, and the program. The proposal complies with requirements in the guidelines for both internal and statewide program review of program quality that both inform the program about ways in which the program may be further refined, and assist staff in determining whether continued program approval is merited.

Review of Guidelines-based Proposals

San Diego County Office of Education, California Educational Leadership Alliance, and Azusa Pacific University have each submitted complete responses to the Commission's *Guidelines for Alternative Professional Clear Administrative Services Credential Programs* (Appendix C). Based on the initial program proposal and additional information provided in response to staff questions and concerns, staff has concluded that each program meets the Commission's Guidelines. Based on this conclusion, staff brings the programs to the Commission for consideration.

III. Options and Considerations

Subject Matter Preparation Program Approval
The Commission has the option to grant or deny initial approval of the Single Subject Matter Industrial Technology Education programs at the following institutions:
    California State University, Los Angeles
    California State University, Fresno

Based on the satisfactory review of responses to Preconditions and Standards for the Single Subject Matter Credential in Industrial Technology Education, both programs meet the requirements for approval. Granting initial program approval to the institutions will allow the institutions to begin offering the programs to meet the subject matter requirements for the Single Subject Credential.

Guidelines for Alternative Professional Clear Administrative Services Program Approval
The Commission has the option to grant or deny initial program approval to the Guidelines-based Alternative Professional Clear Administrative Services Credential programs for the following program sponsors:
    San Diego County Office of Education

California Educational Leadership Alliance
Azusa Pacific University

Based on the satisfactory review of responses to Guidelines all three programs meet the requirements for approval. Granting program approval will allow the program sponsors to begin offering the programs to meet the requirements for the Professional Clear Administrative Services Credential.

Appendix A

California State University, Los Angeles
Single Subject Credential in Industrial and Technology Education

The Professional Teacher Preparation Program

Summary of Program Requirements

Professional Core …………………. 59 Units

Technical Core ……………………. 12 Units

Technology Concentration ………... 16 Units

Teaching Specialization ……………21 Units

Technical Elective …………………. 4 Units
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Total …… 112 Units

Course Work in Curriculum

Professional Core (59 Units):
TECH 101	Industrial Safety	3
TECH 150	Introduction to Higher Education in Technology	2
TECH 200	History of Technology	3
TECH 291	Computers in Technology	3
TECH 380	Graphic Communications Technology	3
TECH 381	Manufacturing Technology	3
TECH 382	Power Technology	3
TECH 398	Cooperative Education	4
TECH 400	Written Communications	4
TECH 414	Industrial Robotics	2
TECH 481	Practicum (Capstone Course)	4
TECH 482	Metrics for Industry (Quality Control)	3
TECH 484	Automated Manufacturing Systems	4
TECH 488	Fluid Power	3
TECH 489	Industrial Training Methods	4
CS 190	BASIC Programming	2
CHEM 151	Fundamentals of Chemistry	5
PHYS 156	Principles of Physics	4

Technical Core (12 Units):
Select 12 units from the following:

TECH 100	Introduction to Automotive	3
TECH 110	Introduction to Drafting	3
TECH 120	Introduction to Electronics	3
TECH 130	Introduction to Graphic Communications	3
TECH 144	Introduction to Industrial Design	3
TECH 160	Introduction to Manufacturing	3

Advanced Technology Concentration (16 Units):
Each student will develop an area of concentration with Adviser's approval.
The concentration may consist of upper-division courses in Design, Electronics, Graphic Communications (referred to as "communications" in the standards), Manufacturing (referred to as "production" in the standards) or Power, Energy and Transportation.

Teaching Specialization (21 Units):

TECH 300A/B	Foundations of Industrial and Technology Education	4
TECH 454A	Technology Education in the Middle Grades	3
TECH 454B	Technology Education in the High Schools	3
TECH 454C	Instructional and Laboratory Curriculum	3
TECH 454D	Organization and Management of I&TE Facilities	4
EDSE 421I	Methods of Teaching I&TE	4

Technical Elective (4 Units):
Selected in consultation with program advisor.

Note:
The coursework listed above constitutes the major only. The lower-division and upper-division general education programs add an additional 72 quarter units to the requirements.

Appendix B

California State University, Fresno
Single Subject Credential in Industrial and Technology Education

The Professional Teacher Preparation Program

CSU Fresno ITE Program Course List

Education Core (43 units)
IT 12 Basic Vehicle Systems (3 units)
IT 30 Exploring Technology Systems (3 units)
IT 41 Industrial Design Graphics (3 units)
IT 52 Electricity and Electronics (3 units)
IT 60 Basic Graphic Arts (3 units)
IT 74 Manufacturing Processes (3 units)
IT 80 Wood Processing Technology (3 units)
IT 92 Industrial Safety Management (3 units)
IT 102 Industrial Computer Concepts and Applications(3 units)
IT 104 Product Design (3 units)
IT 114 Industrial Materials (3 units)
IT 115 CAD Principles and Methods (3 units)
IT 184 Advanced Manufacturing Technology (3 units)
IT 196 Senior Seminar (1 unit)
IT 199 Senior Problem in Industrial Technology (3 units)

Concentrations
A. Computer Aided Design Technology (select 15 units)
IT 116 Applied Visual Programming (3 units)
IT 144 Tool Design Graphics (3 units)
IT 146 Multimedia Development (3 units)
IT 147 Advanced CAD Applications (3 units)
IT 158 Applied Computer Networking I (3 units)
IT 177 Computer-Aided Manufacturing Systems II (3 units)

B. Networking Technology (select 15 units)
IT 116 Applied Visual Programming (3 units)
IT 146 Multimedia Development (3 units)
IT 158 Applied Computer Networking I (3 units)
IT 163 Applied Computer Networking II (3 units)
IT 164 Routers and Internetworking I (3 units)
IT 165 Routers and Internetworking II (3 units)

C. Production Technology (select 15 units)
IT 112 Industrial Process Control Systems I (3 units)
IT 131 Automated Systems I (3 units)
IT 133 Industrial Process Control Systems II (3 units)

IT 134 Computer-Aided Manufacturing Systems I (3 units)
IT 156 Automated Systems II (3 units)
IT 177 Computer-Aided Manufacturing Systems II (3 units)

D. Power, Energy, and Transportation Technology (select 15 units)
IT 106 Energy Conversion and Utilization (3 units)
IT 110 Fluid Power (3 units)
IT 120 Vehicle Engine Systems (3 units)
IT 122 Vehicle Chassis Analysis (3 units)
IT 127 Vehicle Design and Development (3 units)
IT 129 Vehicle Diagnostic Procedures (3 units)

Appendix C

Excerpt from

Standards of Quality and Effectiveness for

Administrative Services Credentials

A Handbook for Teacher Educators and Accreditation Team

Members

Part 6: Program Provider Guidelines for Alternative Professional

Clear Administrative Services Credential Programs

Guidelines

and

Related Expectations

Program Provider Guidelines for Alternative Professional Clear

Administrative Services Credential Programs

Guideline 1:   Program Design and Coordination

The program sponsor identifies the basis upon which decisions will be made in determining developmental objectives for each candidate in the program and for assessing the advancement of each candidate toward those objectives during the course of the program. The program is coordinated effectively, and key program personnel are identified and their responsibilities are clearly defined.

Guideline 1 Expectations:

• The program sponsor identifies general administrator performance expectations for use in identifying each candidate's strengths and weaknesses, setting developmental objectives, and measuring progress. These general expectations may be the California Professional Standards for Educational Leaders or a similar set of administrator performance expectations that focus on instructional leadership.

• The program sponsor provides its general administrator performance expectations to each candidate at the outset of the candidate's participation in the program and explains the performance expectations.

• The program identifies the individual responsible for coordination of the program, key personnel involved in program implementation, and the reporting relationships between the identified personnel. The program identifies the person or entity to whom the authority to certify program completion is designated.

Guideline 2:   Evaluation of Program Quality

The program sponsor conducts ongoing evaluation of the quality and effectiveness of the program for the purpose of identifying needs for program improvement and to ensure that the program is providing mentoring, support and assistance of high quality that is targeted to meet individual candidates' needs. The program sponsor maintains records of services provided to candidates, candidate assessments and other documentation of program and candidate activities for use in external program assessment activities to be conducted by the Commission.

Guideline 2 Expectations:

•   The program evaluation process includes an opportunity for candidates to provide the program sponsor with their perceptions of the quality of the various aspects of the program, including those areas in which the program successfully provided appropriate mentoring, support and assistance, and those areas in which candidates perceived program deficiencies.

•   The program evaluation process includes an opportunity for mentors to provide information on their perceptions of the quality of various aspects of the program, including the appropriateness and sufficiency of mentor training requirements, the effectiveness of criteria for mentor assignment, and the quality of the mentor evaluation process.

•   The program sponsor uses information obtained through the program evaluation process to identify areas in need of improvement and takes appropriate actions to improve and ensure program quality.

•   The program sponsor maintains records of program policies and procedures, services provided to candidates, candidate assessment data, number of mentors, number of participants, and other data related to the program's value, scope and content.

•   The program sponsor consents to providing program information to the Commission upon request and to cooperate with program audit and reporting activities conducted by the Commission.

Guideline 3:   Initial Assessment of Candidate Competence

Within the candidate's first 90 days of employment in a position requiring possession of an administrative services credential, the program sponsor initially assesses candidates based on the program's general administrator performance expectations. This initial assessment includes a candidate self-assessment component in which the candidate describes current job responsibilities and challenges, and perceived personal strengths and weaknesses. The results of this initial assessment inform decisions concerning the administrator's needs and developmental objectives to be met during the course of the program. Mentoring, support and assistance activities initially focus on those areas in which the initial assessment indicates additional support is needed for the candidate to be successful in his/her current assignment.

Guideline 3 Expectations:

- The program's initial assessment is designed to measure a candidate's initial level of competence in each of the program's general administrator performance expectations in a way that can be compared to future assessments of candidate competence so that the program sponsor can determine the candidate's progress and increased administrative effectiveness over time.

- The results of the initial assessment are shared with the candidate and individual(s) assigned to provide the candidate with mentoring, support and assistance to ensure that all parties have a clear understanding of the candidate's initial strengths, weaknesses, and areas of focus for the mentoring, support and assistance to be provided to the candidate.

- The program sponsor maintains a record of each candidate's initial assessment results for comparison with subsequent assessments to determine candidate progress over the course of the program.

- The assessment examines candidate competence authentically, systematically and fairly, and takes into account the highly variable nature of administrative responsibilities.

Guideline 4:   Individualized Mentoring Plan

The program sponsor establishes a process through which a mentoring plan is created for each administrator served by the program. The plan addresses the mentoring, support and assistance needs of each administrator, and may identify additional learning activities needed for the administrator's professional development.   The plan includes developmental objectives that the individual administrator is expected to meet over the course of the program.

Guideline 4 Expectations:

· The program sponsor initially assesses each candidate's strengths and weaknesses based on the program's general administrator performance expectations, and uses the results of this assessment to create an appropriate individualized mentoring plan.

· The candidate's developmental needs and current work context are considered and addressed in the development of the plan.

· The candidate, employer, and a program representative participate in the development of the plan and provide written approval of the initial plan.

· The program sponsor provides an opportunity to review and amend the plan as necessary to meet the administrator's needs or address changes in the administrator's assignment or other aspects of the administrator's work context.   The candidate, employer, and a program representative review and approve any changes to the individualized mentoring plan.

Guideline 5:   Provision of Mentoring, Support and Assistance

The program sponsor provides mentoring, support and assistance that is designed to meet the individual administrator's needs, and is conducted on a regular, ongoing basis throughout the course of, at minimum, the administrator's first two years of administrative service while possessing the Preliminary Administrative Services Credential.

Guideline 5 Expectations:

- The program sponsor, an employer representative, and the administrator collaborate to identify the mentoring, support and assistance needs of the administrator and appropriate means for providing these services.

- The administrator's individual mentoring plan identifies an administrator meeting the qualifications described in Guideline 6 who will serve as the lead mentor* for the administrator.

- The administrator's individual mentoring plan identifies the frequency of regularly scheduled meetings between the administrator and lead mentor. Communication formats for these meetings may be varied (e.g. phone, e-mail, teleconference) but must allow reasonable access for the administrator to the individual(s) assigned to provide support.

- The program sponsor ensures that the administrator has access to mentoring and support in crises or other sensitive situations that occur at times other than the regularly scheduled meetings between the administrator and lead mentor.

- The program sponsor identifies other individuals, in addition to the lead mentor, who have expertise in specific areas applicable to the administrator's current assignment and who will be available to the administrator as needed to provide additional information and guidance.

- The program sponsor provides a list of additional resources that may assist the administrator in succeeding in the current administrative assignment.

- The program sponsor provides opportunities for communication between administrators served by the program to allow for peer engagement and support.

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* "Lead mentor" refers to the individual who will serve in the primary mentoring role for the candidate. These guidelines encourage the use of other qualified individuals to assist in the mentoring role, but require that the program assign a lead mentor to serve as the administrator's primary contact and to lead in the coordination of all mentoring activities.

Guideline 6: Mentor Qualifications and Assignment

The program sponsor establishes specific qualifications for the selection of lead mentors[*] and criteria to be used in determining the appropriate assignment of lead mentors to individual administrators served by the program. Qualifications for lead mentors include appropriate mentor training and experience. The program sponsor establishes an evaluation process for lead mentors and uses the evaluation results to amend mentor selection qualifications and/or training requirements, and to reassign or replace mentors as needed.

Guideline 6 Expectations:

- The program sponsor creates a list of prospective lead mentors of sufficient number to serve all administrators served by the program. All mentors listed meet the qualifications for lead mentors established by the program sponsor.

- Lead mentor qualifications address the number of years of administrative experience and other teaching and services experience; the level and quality of training in support and mentoring; special skills and/or experiences applicable to administrative responsibilities; and other characteristics conducive to successful mentoring, support and assistance.

- The program sponsor's criteria of assignment of lead mentors to individual administrators consider similarities in their current responsibilities and work contexts; geographic proximity; ease of interaction; and other characteristics likely to result in a positive mentoring relationship.

- The program sponsor creates a mechanism for each administrator in the program to evaluate his/her lead mentor. The evaluation provides information on each lead mentor's strengths and weaknesses, identifies areas in which additional training may be required, and rates the overall performance of the mentor from the perspective of the administrator being mentored.

- The program sponsor uses the results of the lead mentor evaluations to make any necessary changes to lead mentor selection qualifications, amend training requirements, and reassign or replace mentors who receive unsatisfactory evaluations.

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[*] "Lead mentor" refers to the individual who will serve in the primary mentoring role for the candidate. These guidelines encourage the use of other qualified individuals to assist in the mentoring role, but require that the program assign a lead mentor to serve as the administrator's primary contact and to lead in the coordination of all mentoring activities.

Guideline 7:   Assessment of Candidate Competence

The program sponsor conducts ongoing assessment of the candidate's competence based on the program's general administrator performance expectations, and provides the results to the candidate and the candidate's lead mentor to be used as an indicator of candidate progress, and to redirect the focus of mentoring, support and assistance, if needed. Prior to certifying that each candidate has completed program requirements, the program sponsor conducts a culminating assessment of the candidate's competence based on the program's general administrator performance expectations and the developmental objectives identified in the candidate's individualized mentoring plan. Through this assessment the program sponsor and the lead mentor verify that the candidate has met the developmental objectives established in the individualized mentoring plan and has reached a level of administrative competence appropriate to merit recommendation for the Professional Clear Administrative Services Credential.

Guideline 7 Expectations:

- Candidates are provided feedback on their progress at multiple points in the program.

- Each candidate's individualized mentoring plan is reviewed periodically on the basis of the assessment results and amended as necessary to respond to changes in the candidate's needs for mentoring, support and assistance.

- The assessment examines candidate competence authentically, systematically and fairly, and takes into account the highly variable nature of administrative responsibilities.

- A culminating assessment forms the basis for certifying that the candidate has successfully completed the program and has reached a level of competence meriting possession of a Professional Clear Administrative Services Credential

Industrial and Technology Education in California Teacher Preparation in California: Standards of Quality and Effectiveness for Subject Matter Programs

Industrial and Technology Education Teacher Preparation in California: Standards of Quality and Effectiveness for Subject Matter Programs

Handbook for Teacher Educators
and Program Reviewers

California Commission on Teacher Credentialing

State of California

1996

The California Commission on Teacher Credentialing

State of California

Pete Wilson, Governor

1996

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The Industrial and Technology Education
Teacher Preparation and Assessment Advisory Panel

California Commission on Teacher Credentialing
1996

Panelists	Professional Positions	Educational Organizations
Gary Doubleday	Secondary Teacher of Industrial Arts	Moreno Valley Unified School District
Neil Heimburge	Secondary Technology & Mentor Teacher	San Diego Unified School District
James Henderson	Program Manager, Academic Relations	International Business Machines
Colleen Hill	Professor of Occupational Studies	California State University Long Beach
Gene A. Lew	Teacher Advisor, Career Development	Los Angeles Unified School District
Ethan Lipton	Chair, Department of Technology	California State University, Los Angeles
Shahnaz Lotfipour	Professor of Educational Technology	California State Polytechnic University, Pomona
Susan Midori-Jones	Elementary Math & Technology Mentor Teacher	Salinas City School District
Phillip Rose	Chair, Teacher Preparation and Professor of Industrial Technology	Humboldt State University
Ray Rummell	Professor of Industrial Technology	California State University
Lisa Salmonson	Secondary Teacher of Industrial Technology	Elk Grove Unified School District
Gary Winegar	Professor of Industrial Technology	California State University, Fresno

Sanford Lee Huddy	Commission Consultant to the Advisory Panel
Lillie Ford	Commission Licensing Advisor to the Advisory Panel
Chris Almeida	California Department of Education Liaison
Rob Griffin	Representative, National Evaluation Systems, Inc.

Industrial and Technology Education
Teacher Preparation in California:
Standards of Quality and Effectiveness
for Subject Matter Programs

Contents

Part 1

Introduction to

Industrial and Technology Education

Teaching Standards

Standards and Credentials for Teachers of Industrial and Technology Education: Foreword by the California Commission on Teacher Credentialing

One of the purposes of education is to enable students to learn the important subjects of the school curriculum, including industrial and technology education. Each year in California, thousands of students enroll in industrial and technology education classes with teachers who are certified by the California Commission on Teacher Credentialing to teach those classes in public schools. The extent to which these students attain industrial and technology knowledge and skills depends substantially on the quality of the preparation of their teachers in industrial and technology education and on the teaching of industrial and technology education.

The Commission is the agency of California government that certifies the competence of teachers and other professionals who serve in the public schools. As a policymaking body that establishes and maintains standards for the education profession in the state, the Commission is concerned about the quality and effectiveness of the preparation of teachers and other school practitioners. On behalf of students, the education profession, and the general public, the Commission's most important responsibility is to establish and implement strong, effective standards of quality for the preparation and assessment of future teachers.

In 1988 and 1992, the legislature and the governor enacted laws that strengthened the professional character of the Commission and enhanced its authority to establish rigorous standards for the preparation and assessment of prospective teachers. As a result of these reform laws (Senate Bills 148 and 1422, Bergeson), a majority of the Commission members are professional educators, and the agency is responsible for establishing acceptable levels of quality in teacher preparation and acceptable levels of competence in beginning teachers. To implement the reform statutes, the Commission is developing new standards and other policies collaboratively with representatives of postsecondary institutions and statewide leaders of the education profession.

To ensure that future teachers of industrial and technology education have the finest possible education, the Commission decided to establish a panel of experts to review recent developments in industrial and technology education and to recommend new standards for the academic preparation of industrial and technology education teachers in California. The Commission's executive director invited colleges, universities, professional organizations, school districts, county offices of education, and other state agencies to nominate distinguished professionals to serve on this panel. After receiving nominations, the executive director appointed the Industrial and Technology Education Teacher Preparation and Assessment Advisory Panel (see page ii). These twelve professionals were selected for their expertise in industrial and technology education, their effectiveness as teachers and professors of industrial and technology education, and their leadership in the industrial and technology education field. The panel was also selected to represent the diversity of California educators and includes industrial and technology education teachers as well as university professors. The panel met on several occasions during 1995 to discuss, draft, and develop the standards in this handbook. The Commission is grateful to the panelists for their conscientious work in addressing many complex issues related to excellence in the subject matter preparation of industrial and technology education teachers.

The Industrial and Technology Education Teaching Credential

The Single Subject Teaching Credential in Industrial and Technology Education authorizes an individual to teach industrial and technology education classes in departmentalized settings. The holders of this credential may teach at any grade level and may serve as industrial and technology education specialists in elementary schools, but the majority of departmentalized industrial and technology education classes occur in grades 7 through 12.

An applicant for a Single Subject Teaching Credential must demonstrate subject matter competence in one of two ways. The applicant may earn a passing score on a subject matter examination that has been adopted by the Commission. Alternatively, the prospective teacher may complete a subject matter preparation program that has been approved by the Commission (Education Code Sections 44280 and 44310). Regionally accredited colleges and universities that wish to offer subject matter programs for prospective teachers must submit those programs to the Commission for approval.

In California, subject matter preparation programs for prospective teachers are not the same as undergraduate degree programs. Postsecondary institutions govern academic programs that lead to the award of degrees, including baccalaureate degrees in industrial and technology education. The Commission sets standards for academic programs that lead to the issuance of credentials, including the Single Subject Teaching Credential in Industrial and Technology Education. An applicant for a teaching credential must have earned a bachelor's degree from an accredited institution, but the degree may be in a subject other than the one to appear on the credential. Similarly, degree programs for undergraduate students in industrial and technology education may or may not fulfill the Commission's standards for subject matter preparation. Completing a subject matter program that satisfies the standards enables a candidate to qualify for the Single Subject Credential in Industrial and Technology Education.

The Commission asked the Industrial and Technology Education Teacher Preparation and Assessment Advisory Panel to create new standards of program quality and effectiveness that could be used to review and approve subject matter preparation programs. The Commission requested the development of standards to emphasize the knowledge, skills and perspectives that teachers must have learned in order to be effective in teaching the subjects that are most commonly included in industrial and technology education courses in the public schools of California.

Standards of Program Quality and Effectiveness

In recent years, the Commission has thoroughly redesigned its policies regarding the preparation of education professionals and the review of preparation programs in colleges and universities. In initiating these reforms, the Commission embraced the following principles or premises regarding the governance of educator preparation programs. The Commission asked the Industrial and Technology Education Teacher Preparation and Assessment Advisory Panel to apply these general principles to the task of creating standards for subject matter programs in industrial and technology education.

(1)   *The status of teacher preparation programs in colleges and universities should be determined on the basis of standards that relate to significant aspects of the quality of those programs.* Program quality may depend on the presence or absence of specified features of programs, so some standards require the presence or absence of these features. It is more common, however, for the quality of educational programs to depend on *how well* the program's features have been designed and implemented in practice. For this reason, most of the Commission's program standards define levels of quality in program features.

(2)   *There are many ways in which a teacher preparation program can be excellent.* Different programs are planned and implemented differently and are acceptable if they are planned and implemented well. The Commission's standards are intended to differentiate between good and poor programs. The standards do not require all programs to be alike, except in their quality, which assumes different forms in different environments.

(3)   *The curriculum of teacher education plays a central role in a program's quality.* The Commission adopts curriculum standards that attend to the most significant aspects of knowledge and competence. The standards do not prescribe particular configurations of courses, or particular ways of organizing content in courses, unless professionals on an advisory panel have determined that such configurations are essential for a good curriculum. Similarly, curriculum standards do not assign unit values to particular domains of study unless there is a professional consensus that it is essential for the Commission's standards to do so. Curriculum standards for industrial and technology education teacher preparation are listed as Standards 1 through 13 in this handbook.

(4)   *Teacher education programs should prepare candidates to teach the public school curriculum effectively.* The Commission asked the Industrial and Technology Education Advisory Panel to examine and discuss the *Industrial and Technology Education Implementation Guide,* as well as other state curriculum policies in industrial and technology education. The major themes and emphases of subject matter programs for teachers must be congruent with the major strands and goals of the school curriculum. It is also important for future teachers to be in a position to *improve* the school curriculum on the basis of new developments in the scholarly disciplines and in response to changes in student populations and community needs. However, it is indispensable that the Commission's standards give emphasis to the subjects and topics that are most commonly taught in public schools.

(5)   *In California's public schools, the student population is so diverse that the preparation of educators to teach culturally diverse students cannot be the exclusive responsibility of professional preparation programs in schools of education.* This preparation must begin early in the collegiate experience of prospective teachers. The Commission expects subject matter preparation programs to contribute to this preparation, and asked the Industrial and Technology Education Advisory Panel to recommend an appropriate program standard. The panel concurred with this request and recommended Standard 4 in Part 2 of this handbook.

(6)   *The curriculum of a teacher education program should be based on an explicit statement of purpose and philosophy. An excellent program also includes student services and policies such as advisement services and admission policies.* These components of teacher preparation contribute significantly to the quality of the program; they make the program more than a collection of courses. The Commission asked the Industrial and Technology Education Advisory Panel to develop standards related to (a) the philosophy and purpose of industrial and technology education teacher preparation and (b) significant, noncurricular components of teacher preparation, to complement the curriculum standards. Again the panel concurred, and Standards 1 and 14 through 17 are the result.

(7)   *The assessment of each student's attainments in a teacher education program is a significant responsibility of the institution that offers the program.* This assessment should go beyond a review of transcripts to verify that acceptable grades have been earned in required and elective courses. The specific form, content and methodology of the assessment should be determined by the institution. In each credential category, the Commission's standards attend to the overall quality of institutional assessments of students in programs. Standard 19 in this document is consistent with this policy of the Commission.

(8)   *The Commission's standards of program quality allow quality to assume different forms in different environments.* The Commission did not ask the advisory panel to define all of the acceptable ways in which programs could satisfy a quality standard. The standards should define *how well* programs must be designed and implemented; they must not define specifically and precisely *how* programs should be designed or implemented.

(9)   *The Commission's standards of program quality are roughly equivalent in breadth and importance.* Each standard is accompanied by a rationale that states briefly why the standard is important to the quality of teacher education. The standards should be written in clear, plain terms that are widely understood.

(10)   *The Commission assists in the interpretation of the standards by identifying the important factors that should be considered when a program's quality is judged.* The Commission's adopted standards of program quality are mandatory; each program must satisfy each standard. "Factors to Consider" are not mandatory in the same sense, however. These factors suggest the types of questions that program reviewers ask and the types of evidence they will assemble and consider when they judge whether a standard is met. Factors to consider are not "mini-standards" that programs must meet. The Commission expects reviewers to weigh the strengths and weaknesses of a program as they determine whether a program meets a standard. The Commission does not expect every program to be excellent in relation to every factor that could be considered.

(11)   *Whether a particular program fulfills the Commission's standards is a judgment that is made by professionals who have been trained in interpreting the standards.* Neither the Commission nor its professional staff make these judgments without relying on subject matter experts who are trained in program review and evaluation. The review process is designed to ensure that subject matter programs fulfill the Commission's standards initially and over the course of time.

The Commission fulfills one of its responsibilities to the public and the profession by adopting and implementing standards of program quality and effectiveness. While assuring the public that educator preparation is excellent, the Commission respects the considered judgments of educational institutions and professional educators, and holds educators accountable for excellence. The premises and principles outlined above reflect the Commission's approach to fulfilling its responsibilities under the law.

Analysis and Adoption of the Industrial and Technology Education Program Standards

The Industrial and Technology Education Teacher Preparation and Assessment Advisory Panel drafted the program quality standards and a set of preconditions for program approval during three two-day meetings in 1995. Meeting in public, the Commission then reviewed and discussed the draft standards and preconditions, as well as a draft plan for implementing the standards. The Commission distributed the draft standards, preconditions, and implementation plan to industrial and technology education educators throughout California, with a request for comments and suggestions. The draft standards and other policy proposals were forwarded to:

• Academic administrators of California colleges and universities;
• Chairpersons of Industrial and Technology Education Departments in colleges and universities;
• Deans of Education in California colleges and universities;
• Presidents of professional associations of industrial and technology education teachers; and
• Industrial and Technology Education professors, teachers and specialists.

The Commission asked 120 middle and high school principals to forward the draft policies to industrial and technology education teachers and curriculum specialists for their analysis and comments.

After allowing a period for public comments, the Commission's professional staff compiled the responses to each standard and precondition, as well as comments about the implementation plan, which were reviewed thoroughly by the Advisory Panel. The panel exercised its discretion in responding to the suggestions, and made minor changes in the draft standards and preconditions. On February 1, 1996, the Advisory Panel presented the completed standards, preconditions, and implementation plan to the Commission, which adopted them on February 2, 1996.

Alignment of Program Standards and Subject Matter Assessments

Since 1970, many applicants have qualified for the Single Subject Credential in Industrial and Technology Education by passing a standardized exam that was adopted by the Commission: the National Teachers Examination (NTE) in Industrial and Technology Education. These prospective teachers of industrial and technology education qualified for credentials without completing programs of subject matter study that were approved by the Commission. Following an exhaustive study of the validity of the NTE examinations in 1987, the Commission determined the need for new examinations that more accurately reflect (1) the subject matter programs that prepare teachers in California and (2) the curriculum in California's public schools.

The Commission awarded a contract to National Evaluations Systems, Inc. (NES) in January 1995, to develop new single subject examinations that align with the subject matter program standards. The Commission and NES asked the Industrial and Technology Education Advisory Panel to develop subject matter assessment specifications that would be as parallel and equivalent as possible with the new subject matter program standards in this handbook. These assessment specifications will guide the scope and content of test items in the development of the new industrial and technology education examination. The advisory panel's draft specifications were disseminated to 185 industrial and technology education teachers, professors, and curriculum specialists throughout California to determine their relatedness to the job of an industrial and technology education teacher. Following an extensive review of the draft specifications, the panel made minor revisions and the completed specifications were adopted by the Commission on February 2, 1996.

These specifications are now the basis for the new industrial and technology education examination being developed by NES, which will include both a multiple-choice and a constructed-response component. This examination will be designed to assess a candidate's industrial and technology knowledge and skills, and the ability to respond critically to complex problems and situations encountered in the field of industrial and technology education. Candidates who seek to qualify for the Single Subject Credential in Industrial and Technology Education by examination will be required to pass the Single Subject Assessment for Teachers (SSAT) in Industrial and Technology Education beginning with the first test administration in October 1996.

The Commission's new *Specifications for the Assessment of Subject Matter Knowledge and Competence in Industrial and Technology Education* are included in this handbook (pages 39 through 44) to serve as a resource in the design and evaluation of subject matter programs for future teachers of industrial and technology education.

Standards for Professional Teacher Preparation Programs

The effectiveness of industrial and technology education in California schools does not depend entirely on the subject matter preparation of industrial and technology education teachers. Another critical factor is the teacher's ability to *teach* industrial and technology education. To address the *pedagogical* knowledge and effectiveness of industrial and technology education teachers, the Commission adopted and implemented *Standards of Program Quality and Effectiveness for Professional Teacher Preparation Programs*. These thirty-two standards define levels of quality and effectiveness that the Commission expects of teacher education programs that are offered by schools of education. These standards originated in Commission-sponsored research as well as the published literature on teacher education and teacher effectiveness. Approximately 1,500 educators from all levels of public and private education participated in developing the standards during a two-year period of dialogue and advice. The standards are now the basis for determining the status of professional preparation programs for Single Subject Teaching Credentials in California colleges and universities. The Commission also adopted special standards for future teachers who intend to teach students with limited English skills in the schools. The standards in this handbook have been prepared for subject matter programs, and are designed to complement the Commission's existing standards for programs of pedagogical preparation.

Subject Matter Standards for Prospective Elementary School Teachers

Elementary school teachers are expected to establish foundations of knowledge, skills, and attitudes that young students need in order to succeed in more advanced classes in secondary schools. To address the preparation of future classroom teachers in elementary schools, the Commission appointed an advisory panel to develop new *Standards of Program Quality for the Subject Matter Preparation of Elementary Teachers.* Following a thorough process of research, development and consultation, the Commission adopted these standards, which relate to (1) the broad range of subjects that elementary teachers must learn, and (2) the essential features and qualities of programs offered in liberal arts departments. The Commission appointed and trained two professional review panels, which have examined 72 subject matter programs for prospective elementary teachers, and have recommended 62 of these programs for approval by the Commission. As a result of this reform initiative, approximately 25,000 prospective elementary teachers are now enrolled in undergraduate programs that meet high standards of quality for subject matter preparation across a broad range of disciplines.

Overview of the Industrial and Technology Education Standards Handbook

Part 1 of this handbook concludes with a statement by the Industrial and Technology Education Advisory Panel regarding the nature of industrial and technology education teaching and the preparation of industrial and technology education teachers. Then Part 2 of the handbook includes the twenty basic standards for industrial and technology education, and the Advisory Panel's *Specifications for the Subject Matter Knowledge and Competence of Prospective Teachers of Industrial and Technology Education.* Finally, Part 3 of the handbook provides information about implementation of the new standards in California colleges and universities.

Contributions of the Industrial and Technology Education Advisory Panel

The California Commission on Teacher Credentialing is indebted to the Industrial and Technology Education Teacher Preparation and Assessment Advisory Panel for the successful creation of *Standards of Program Quality and Effectiveness for the Subject Matter Preparation of Industrial and Technology Education Teachers.* The Commission believes strongly that the panel's standards will improve the teaching and learning of industrial and technology education in public schools.

Request for Assistance from Handbook Users

The Commission periodically reviews its policies, in part on the basis of responses from colleges, universities, school districts, county offices, professional organizations and individual professionals. The Commission welcomes all comments about the standards and information in this handbook, which should be addressed to:

> California Commission on Teacher Credentialing
> Professional Services Division
> 1812 Ninth Street
> Sacramento, California 95814-7000

Industrial and Technology Education
and the Preparation of Technology Teachers:
Introduction by the Advisory Panel

Technology is a body of knowledge and resources that are systematically applied to produce outcomes in response to human needs and desires. In a school environment, Industrial and Technology Education has been defined as a discipline for the study of the application of knowledge, creativity, and resources to solve problems and extend human potential. It includes educational programs concerned with technology and industry--their systems, techniques, resources, organization, products, evolution, utilization, significance and impact on society.

Industrial and Technology Education includes programs for all students of all grades, abilities and backgrounds. The programs are aimed at providing the technological literacy, knowledge, skills and attitudes necessary to become competent, contributing and productive members of society. It prepares citizens who are able to direct, control and manage their technological environments. They are also able to respond to the needs of business and industry for trained workers and managers. Industrial and Technology Education helps students learn how to think critically about issues related to technology and to develop informed attitudes about various technologies and their special social, cultural, economic and ecological consequences.

Industrial and Technology Education in California is a kindergarten through university continuum of well-planned, coordinated, articulate, integrated and sequential experiences for all students. It includes a wide range of programs including, but not limited to: breadth programs (Technology Education for Children, Exploring Technology, Technology Core), specialized career path programs based on one or more technology concentrations (communication; production; power, energy and transportation; related technologies), and integrated programs (applied academics, principles of technology, academies).

Industrial and Technology Education incorporates many attributes that are important to the preparation of students for lifelong learning in a technological society. These include the unique relationship between theory and practice; invention and innovation in the efficient and safe application of processes, materials and tools; a multiple solutions approach to technological problems; activity-oriented laboratory experiences incorporating the reinforcement of abstract concepts with concrete activities; and a combined emphasis on "know-how" and the "ability to do."

It is important to distinguish between Industrial and Technology Education which includes programs that focus on technology and industrial applications as the content of learning and Instructional or Educational Technology which focuses on the delivery of instruction. A Report to the President and Congress of the United States by the Commission on Instructional Technology defined Instructional Technology as "a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and non human resources to bring about effective instruction." These two disciplines are related as instructional technology is used in the delivery of Industrial and Technology Education and components of it are among the many technologies that are included within the content areas of Industrial and Technology Education.

Learning to use computers and non computer-based technologies as tools for learning, teaching and problem solving in Industrial and Technology Education should be a characteristic of a subject matter teacher preparation program. However, Instructional or Educational Technology is **not** Industrial and Technology Education. Nor is it more than a small component of the content area preparation for industrial and technology educators.

Technology is one of the most powerful forces in the world today. It affects all phases of our lives and is a major variable in occupational success. The increasing need for a technologically literate citizenry and a competent and flexible workforce demands that students have educational experiences ensuring they are able to understand and apply technology. Students must be able to apply principles of technology, science, mathematics, engineering and communication to solve problems, think critically, reason and communicate effectively.

Technology Education in California is critical for all students to ensure productivity/competitiveness and to facilitate career development. Students must have learning experiences to become competent knowledgeable workers and be able to make informed decisions with respect to their careers and the future economy.

Dynamic changes in technology and its impact on our lives require that new industrial and technology teachers have a solid foundation that includes both breadth and depth. Programs that prepare California's industrial and technology teachers must be well-designed, academically challenging and comprehensive in scope. They must include coursework in the areas of general education, technological competency and professional education. Effective programs provide learning experiences that enable teacher candidates to acquire sufficient and appropriate subject matter knowledge (breadth and depth) and professional education.

As technology changes, the needs of students in technology education programs will change. Programs that prepare technology teachers must provide teacher candidates with the understanding to recognize and incorporate the technology of the future and its application into their instructional programs. This requires breadth of programs that prepare industrial and technology teachers based on a comprehensive general education curriculum and a foundation that includes an understanding of technology (systems, processes, materials, skills, tools), the roles of technology and its impact on society (i.e., cultural, ecological, economic, social) and industry, the importance of technology in career preparation, and the components of workplace know-how and foundation skills for career success. The subject matter content of an Industrial and Technology Education teacher preparation program should be consistent with the Industrial and Technology Education Career Path Guide for California Public Schools, Kindergarten through Grade Twelve. Teacher candidates must also understand the relationship among areas within technology and the interrelationships among other academic disciplines.

Industrial and technology teacher preparation programs must also provide depth in at least one concentration to ensure that each candidate has a significant level of expertise in that area. Learning experiences of teacher candidates must include opportunities for them to apply concepts, principles and processes and incorporate the use of materials and skills to solve significant problems within that area and across other systems.

Industrial and technology teacher preparation programs should provide a foundation that will assist the candidate in developing environments that facilitate learning and help their students achieve their potential. Teacher preparation programs should provide opportunities for students to research and assess current and emerging technologies. Their instructional programs should incorporate the competencies previously discussed and model appropriate instructional strategies and delivery systems. They should provide opportunities for leadership development and experiences working in cooperative teams. Teacher candidates should have an understanding of professional organizations and their importance to the success of industrial and technology educators.

Industrial and Technology Education in California's public schools is critical for the economic vitality of the State and the growth of students into technologically literate citizens who are prepared for their future roles in society. A quality Industrial and Technology Education teacher education program provides candidates with the requisite experiences and resources to be effective teachers of Industrial and Technology Education.

Part 2

Standards of Program Quality and

Effectiveness in Industrial and

Technology Education

Definitions of Key Terms

Standard

A "standard" is a statement of program quality that must be fulfilled for initial or continued approval of a subject matter program by the Commission. In each standard, the Commission has described an acceptable level of quality in a significant aspect of industrial and technology education teacher preparation. The Commission determines whether a program satisfies a standard on the basis of an intensive review of all available information related to the standard by a review panel whose members (1) have expertise in industrial and technology education teacher preparation, (2) have been trained in the consistent application of the standards, and (3) submit a recommendation to the Commission regarding program approval.

The Commission's adopted Standards of Program Quality and Effectiveness for Subject Matter Programs in Industrial and Technology Education begin on page 17 of this handbook. The Commission's authority to establish and implement the standards derives from Section 44259 (b) (5) of the California Education Code.

Factors to Consider

"Factors to Consider" serve to guide program review panels in judging the quality of a program in relation to a standard. Within the scope of a standard, each factor defines a dimension along which programs vary in quality. The factors identify the dimensions of program quality that the Commission considers to be important. To enable a program review panel to understand a program fully, a college or university may identify additional quality factors and may show how the program fulfills these added indicators of quality. In determining whether a program fulfills a given standard, the Commission expects the review panel to consider all of the related quality factors in conjunction with each other. In considering the several quality factors for a standard, excellence in one factor compensates for less attention to another indicator by the institution. For subject matter programs in industrial and technology education, the adopted Factors to Consider begin on page 17.

Precondition

A "precondition" is a requirement for initial and continued program approval that is based on California state laws or administrative regulations. Unlike standards, preconditions specify requirements for program compliance, not program quality. The Commission determines whether a program complies with the adopted preconditions on the basis of a program document provided by the college or university. In the program review sequence, a program that meets all preconditions is eligible for a more intensive review to determine if the program's quality satisfies the Commission's standards. Preconditions for the approval of subject matter programs in industrial and technology education are on page 16. Details regarding the program review sequence are on pages 54 through 59.

Preconditions for the Approval of Subject Matter Programs in Industrial and Technology Education

The following Preconditions must be met for the Approval of Subject Matter Programs in Industrial and Technology Education. The Commission's statutory authority to establish and enforce the preconditions is based on Sections 44310 through 44312 of the California Education Code.

(1)   Each program of subject matter preparation for the Single Subject Teaching Credential in Industrial and Technology Education shall consist of at least 45 semester units or 67 quarter units of course work in Industrial and Technology Education and closely related subjects. Each program shall include breadth courses and one or more concentrations as specified in Preconditions 2 and 3.

(2)   Breadth courses shall address Standard 2 by developing foundations in communication; production; power, energy and transportation; and technology and shall comprise at least 36 semester units or 54 quarter units.

In addition to describing how a program meets each standard of program quality in this handbook, the program document by an institution shall include a listing and catalog description of all breadth courses that address Standard 2. Institutions shall have flexibility to define the breadth component of a program as (a) a core of required course work that fulfills Standard 2, or (b) elective course work that is structured to ensure that each student's studies fulfill Standard 2. Institutions may also determine whether the breadth curriculum consists of (a) distinct courses in communication; production; power, energy and transportation; and technology or (b) courses that offer integrated coverage of these subjects.

(3)   Each program shall include at least one of the concentrations under Standard 3, to provide depth of study in an area selected by each student. In each concentration, the depth courses shall comprise at least 9 semester units or 13 quarter units.

A program document shall include a listing and catalog description of all courses that constitute each concentration. Institutions shall have flexibility to define each concentration as (a) a core of specifically required course work that fulfills Concentration 3A or 3B or 3C of Standard 3, or (b) elective course work that is structured to ensure that each student fulfills Concentration 3A or 3B or 3C of Standard 3.

Course work offered by any appropriate department(s) of a regionally accredited institution may satisfy the preconditions and standards in this handbook.

Standards of Program Quality and Effectiveness

Category I: Curriculum and Content of the Program

Standard 1

Program Philosophy and Purpose

The subject matter preparation program in Industrial and Technology Education is based on an explicit statement of program philosophy that expresses its purpose, design and desired outcomes, and defines the institution's concept of a well-prepared teacher of Industrial and Technology Education. The program philosophy, design and desired outcomes are appropriate for preparing students to teach Industrial and Technology Education in California schools.

Rationale for Standard 1

To insure that a subject matter program is appropriate for prospective teachers, it must have an explicit statement of philosophy that expresses the institution's concept of a well-prepared teacher of the subject. This statement provides direction for program design and it assists the faculty in identifying needs and emphases, developing course sequences and conducting program reviews. The philosophy statement also informs students of the basis for program design, and communicates the institution's aims to school districts, prospective faculty members and the public.   The responsiveness of a program's philosophy, design and desired outcomes to the contemporary conditions of California schools are critical aspects of its quality.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- The program philosophy, design and desired outcomes are collectively developed by participating faculty, and business and industry representatives, as well as others; reflect an awareness of recent paradigms and research in the discipline of Industrial and Technology Education; and are consistent with each other.

- The program philosophy is consistent with the major themes and emphases of the California State Curriculum Framework, other state curriculum documents, and nationally adopted guidelines for teaching Industrial and Technology Education.

- The statement of program philosophy shows a clear awareness of the preparation that candidates need in order to teach Industrial and Technology Education effectively among diverse students in California schools.

- Expected program outcomes for students are defined clearly so student assessments and program reviews can be aligned appropriately with the program's goals.

- The institution periodically reviews and reconsiders the program philosophy, design and intended outcomes in light of recent developments in the discipline, nationally accepted standards and recommendations, and the needs of public schools.

- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 2

Breadth of Study in Industrial and Technology Education

The overall program in Industrial and Technology Education is organized to assure that students meeting the requirements of the program acquire sufficient understanding in Industrial and Technology Education so that, as future teachers, they will have the necessary background to impart a high quality technological literacy to their students. Breadth of studies provide familiarity with the nature of technology and major ideas common to all technologies, including: design, problem solving, technological models and systems, work place know-how, and their interactions. The program provides a foundation in communication; production; power, energy and transportation; and related technologies. The program also provides opportunities for students to engage in further studies in these technologies. Breadth of studies in the program familiarize all students with important societal, environmental and economic concerns and the application of technological principles.

Rationale for Standard 2

An effective Industrial and Technology Education teacher needs to be broadly educated in technology in order to teach a coordinated technology curriculum that emphasizes the major themes and concepts of communication, production; power, energy and transportation; and related technologies as reflected in the *Industrial and Technology Education Career Path Guide for California Public Schools, Kindergarten through Grade Twelve.*

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which breadth studies in the program:

- Encompass the general Industrial and Technology Education specifications for subject matter knowledge and competence, including the following general areas of study:

  - communication; production; power, energy and transportation; and other related technological systems and their interactions;
  - technological models, including design and problem solving;
  - workplace know-how; and
  - the history and foundations of technology.

- encourage students to apply technological knowledge to everyday experiences and uses of technology.
- enable students to conceptualize a view of the technological enterprise as a human endeavor with moral, ethical and economic consequences for society.
- encourage students to appreciate connections and commonalties among the traditional disciplines of technology.
- engage student in decision making, methods of inquiry, and collaborative and cooperative learning groups.
- exhibit other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 3

Depth of Study in a Concentration Area

Each candidate for the Single Subject Credential in Industrial and Technology Education must complete a subject matter program that includes a concentration of studies as described in 3A, 3B, or 3C.

Concentration 3A: Depth of Study in Communication Technology

A Concentration in Communication Technology includes studies of one or more Communication Technology specializations substantially beyond those required for general industrial and technology literacy in Standard 2. The depth and breadth of study in Concentration 3A should be that which is normally associated with a specialization in a Communication Technology and should provide conceptual foundations that may include design/drafting/CADD, graphic communications and electronic publishing, electronic communications (telecommunications, audio, visual), and/or multimedia. Concentration 3A includes in-depth study and laboratory/field experiences in communication; achievement of an appropriate level of understanding in related academics such as science, mathematics and language arts; use of methods employed by technologists in the generation of technological knowledge; and the application of communication technologies to societal issues, including ethical, moral and economic considerations.

Rationale for Concentration 3A

Holders of the Industrial and Technology Education Credential who have a Concentration of studies in Communication Technology may be required to teach a wide variety of courses in their teaching assignments. A thorough coverage of the subject is essential to address the major themes and concepts of the *Industrial and Technology Education Career Path Guide for California Public Schools, Kindergarten through Grade Twelve*. Breadth and depth of Communication Technology is necessary for teaching advanced and specialized courses, planning curriculum, selecting appropriate educational materials, providing an effective educational program, and serving as a member of an interdisciplinary team of teachers.

Concentration 3B: Depth of Study in Production Technology

A Concentration in Production Technology includes studies of one or more Production Technology specializations substantially beyond those required for general industrial and technology literacy in Standard 2. The depth and breadth of study in Concentration 3B should be that which is normally associated with a specialization in Production Technology, and should provide conceptual foundations across the discipline. Integral to the concentration are conceptual foundations that may include construction and manufacturing. Concentration 3B includes in-depth study and laboratory/field experiences in production, achievement of an appropriate level of mathematics, use of methods employed by technologists in the generation of technological knowledge, and application of production technologies to societal issues, including ethical, moral economic considerations.

Standard 3: Depth of Study in a Concentration Area (Continued)

Rationale for Concentration 3B

Holders of the Industrial and Technology Credential who have a Concentration in Production Technology will be required to teach a wide variety of courses in their teaching assignments. A thorough coverage of the subject is essential to address the major themes and concepts of the *Industrial and Technology Education Career Path Guide for California Public Schools, Kindergarten through Grade Twelve*. Breadth and depth understanding of Production Technology is necessary for teaching advanced and specialized courses, planning curriculum, selecting appropriate educational materials, providing an effective educational program, and serving as a member of an interdisciplinary team of Industrial and Technology Education teachers.

Concentration 3C: **Depth of Study in Power, Energy and Transportation Technology**

The Concentration in Power, Energy and Transportation Technology includes studies of Power, Energy and Transportation substantially beyond those required for general industrial and technology literacy in Standard 2. The depth and breadth of study in Concentration 3C should be that which is normally associated with a specialization in Power, Energy and Transportation technology, or related fields, and should provide conceptual foundations distributed across the discipline, including the study of physics, chemistry, and mathematics. Integral to the concentration are conceptual foundations that include generation of power and energy (e.g., nuclear, fossil fuel, solar, wind), and its transmission, transformation, storage, and control in mechanical, fluid, thermal, and electrical systems. Course work and laboratory/field experiences should include transportation technology, including propulsion, suspension, guidance, control, support, and structural components of land, air and sea transportation systems.

Rationale for Concentration 3C

Holders of the Industrial and Technology Credential who have a Concentration in Power, Energy and Transportation Technology will be required to teach a wide variety of courses in their teaching assignments. A thorough coverage of the subject is essential to address the major themes and concepts of the *Industrial and Technology Education Career Path Guide for California Public Schools, Kindergarten through Grade Twelve*. Breadth and depth understanding of Power, Energy and Transportation Technology is necessary for teaching advanced and specialized courses, planning curriculum, selecting appropriate educational materials, providing an effective educational program, and serving as a member of an interdisciplinary team of Industrial and Technology Education teachers.

Standard 3: Depth of Study in a Concentration Area (Continued)

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which Concentration students:

• Complete a sequence of courses in a specialization that helps develop depth in that concentration.

• Demonstrate their knowledge of the use of systems and resources appropriate to that concentration.

• Demonstrate their ability to analyze, evaluate and solve problems related to their concentration.

• Understand how their knowledge of and experiences in their concentration relates to industry and industrial applications.

• Participate in well planned laboratory/field experiences aimed at reinforcing the connections between the educational environment and industrial applications.

• Understand factors related to professionals (i.e., professionalism, responsibilities, ethics, values) in their area of concentration.

• Understand the interrelationships within their area of concentration as well as with other academic areas.

• Study recent industrial trends, career paths and opportunities.

• Select appropriate technology (processes, machines, materials, and tools) to solve problems.

• Understand regulatory and legal requirements, processes purposes and procedures in their area of concentration.

• Understand processes and procedures used in different types of construction (residential and/or commercial).

• Understand a variety of automated manufacturing systems such as "just in time", tool design, design for manufacturing, flexible manufacturing systems and materials resource planning.

• Understand procedures for ensuring and maintaining quality control and procedures for managing operations, including the management and financial impact of operational and line decisions.

• Gain experience in a variety of systems (e.g., foundations in basic electrical, thermal, mechanical, and fluid systems).

• Gain a conceptual understanding and experience in various means and technologies of within their area of concentration.

Standard 3: Depth of Study in a Concentration Area (Continued)

- Receive a strong mathematical foundation that emphasizes the analysis of systems, including their efficiency.

- Receive a strong foundation in the physical sciences, including laboratory experiences.

- Experience other factors to this standard that are brought to the reviewers' attention by the institution.

Standard 4

Diversity and Equity in the Program

The program provides multiple opportunities for students to understand and appreciate the role of human diversity in Industrial and Technology Education, including cultural, ethnic, gender, age, socio-economic, language diversity, and individuals with exceptional needs. The program promotes educational equity by utilizing instructional, advisement and curricular practices that offer equal access to program content and career options for all students.

Rationale for Standard 4

The student population of California's schools is increasingly diverse. From an ethical and intellectual standpoint, it is crucial to systematically include all students in the continuing study of Industrial and Technology Education. It is imperative that teachers understand the contributions of individuals from various groups to the development of this discipline. Prospective teachers of Industrial and Technology Education need to understand and develop sensitivity to the ways in which diverse groups affect and are affected by Industrial and Technology Education. They must also be aware of barriers to participation and success, and must experience equitable practices of education during their preparation.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- In the course of the program, students experience classroom practices and use instructional materials that promote educational equity among diverse learners.

- The program includes faculty and other role models from diverse cultural and ethnic groups, men and women, and individuals with exceptional needs.

- The program includes faculty who are concerned about and sensitive to diverse cultural and ethnic groups, gender, and individuals with exceptional needs.

- The institution encourages men and women who are culturally and ethnically diverse to enter and complete the subject matter program.

- Each student learns about the contributions and perspectives of diverse cultural, ethnic and gender groups related to Industrial and Technology Education.

- Students examine ways in which the growth and development of Industrial and Technology Education have affected different cultural, ethnic, gender and individuals with special needs.

- Course work in the program fosters understanding, respect, and appreciation of human differences.

- The program has other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 5

**Computer Literacy and
Educational/Instructional Technology**

The program employs multiple strategies, activities and materials that are appropriate for effective instruction and assessment of learning and development in Industrial and Technology Education and provides the foundation for the students to examine and use technology in the teaching and learning process. The students will demonstrate knowledge of basic operations, terminology and capabilities of computer-based technologies.

Rationale for Standard 5

Learning to use computer-based technologies as a tool for learning industrial technology should be a pervasive characteristic of a subject matter program for teachers. Incorporating the use of current instructional strategies and technologies is critical to enhance student learning.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- The program assures adequate access to computing resources and incorporates learning experiences that allow teacher candidates to develop an understanding of computer technology and its applications.

- The program provides opportunities for students to analyze, compare, and evaluate the appropriateness of technological tools and their uses in teaching and learning industrial technology.

- The program utilizes appropriate technological tools when providing instruction and assessing students in industrial technology.

- The program provides opportunities for students to use technologies in a variety of instructional situations, including group presentations.

- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 6

Industrial and Technology Education as a Profession

The student demonstrates knowledge of the philosophy and history of Industrial and Technology Education, the status of Industrial and Technology Education in contemporary society, trends in Industrial and Technology Education such as interdisciplinary collaboration, and the role of the educator in promoting the profession.

Rationale for Standard 6

Understanding the role of Industrial and Technology Education in contemporary society requires knowledge of its philosophical and historical development and enables students to begin to formulate a personal philosophy. Students need to understand that active involvement in local school settings, professional organizations, and in the legislative process is vital to continual professional growth and to the promotion of Industrial and Technology Education.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- Past and present philosophies of Industrial and Technology Education and their impact on the goals, scope and components of Industrial and Technology Education programs.

- Historical development of Industrial and Technology Education.

- Study of the contributions of noteworthy industrial and technology educators of various backgrounds, races, ethnicities, genders, and national origins.

- Study of current programs and practices within a historical perspective.

- Examination of ethics and values of professional Industrial and Technology Education teachers.

- Study of current issues affecting Industrial and Technology Education such as legislation, mandates, policies, and practices and the responsibilities of educators as members of the profession.

- Emphasis on responsibilities and benefits of being an active member in professional organizations.

- Emphasis on the importance of staying abreast of the current knowledge base of the discipline.

- Emphasis on the importance of being actively involved with other professional activities in the job setting.

Standard 6: Industrial and Technology Education as a Profession (Continued)

• Emphasis on the responsibilities and benefits of being an active member of local, school, and community activities.

• Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 7

Career Opportunities and Preparation

The teacher candidate learns techniques to help their future students understand career paths and strategies for obtaining employment; demonstrate core competencies and foundation skills required for satisfactory employee performance; demonstrate knowledge of issues related to career development, lifelong learning, and entrepreneurship; demonstrate knowledge of management, structure, roles, functions, and responsibilities of an industrial/technology organization in both the public and private sector.

Rationale for Standard 7

As with all disciplines, it is important for students to understand the connection between employment/career opportunities and their education. It is critical that students are aware of what competencies employers require. Workplace know-how prepares effective employees that can productively use:

- resources (people, equipment, technology, etc.).
- interpersonal skills (ability work in a team environment).
- information (ability to process and communicate information in a logical manner).
- systems (ability to understand their interrelations and to design and improve their effectiveness).
- technology (ability to select appropriate technology to complete specific tasks).

Competent workers in the high-performance workplace need foundation skills including:

- basic skills (reading, writing, and mathematics, speaking and listening).
- thinking skills (ability to learn, to reason, to think creatively, to make decisions and solve problems).
- personal qualities (individual responsibility, self-esteem and self-management, sociability and integrity).

Students must have as much information as possible in order to make informed decisions with respect to their future employment and careers.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program:

- Provides opportunities for input from business and industry regarding employment, career opportunities, job skills, and necessary employee competencies.

- Includes a project-management component and opportunities for students to demonstrate project-management skills (i.e. organizing, planning, scheduling, budgeting, assessing and reporting, etc.).

Standard 7: Career Opportunities and Preparation

- Includes opportunities for students to explore entrepreneurships, risk assessment, and risk management.

- Creates opportunities for students to become aware of the importance of life long learning.

- Includes development of workplace skills as stated in the above rationale.

- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 8

Technological Literacy and Capability

The program prepares students to become literate in a variety of current and emerging technologies. Students will demonstrate cognitive, affective, and psychomotor capabilities in the use of those technologies.

Rationale for Standard 8

Technology is both a body of knowledge and a process of purposeful application of knowledge and skills. The knowledge base of technology relates to the processes, resources, and tools used to create products, systems, and services to meet human demands. The process of technological design and problem-solving is what makes the knowledge base useful. The knowledge and skills base and the design and problem-solving process are woven together in technological endeavors.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program enables students to:

- Develop basic skills in the proper use of processes, machines, materials, and tools.

- Solve problems involving the processes, machines, materials, tools, products, and services of industry and technology

- Select appropriate technology to accomplish a task or solve a problem.

- Adapt to changing technology through identifying, learning, and applying new knowledge and skills.

- Understand and use appropriate terminology/vocabulary.

- Use available resources.

- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 9

Problem-Solving Skills

Students demonstrate a variety of problem-solving techniques and critical thinking skills as they apply to Industrial and Technology Education, including those taught through the study and application of science and math and other related disciplines.

Rationale for Standard 9

Students need to identify, locate, and organize needed information or data; and propose, develop, evaluate, and select from alternative solutions. Analytical techniques are necessary for technology and are an integral part of prediction, design, data collection, analysis, and measurement. Students must be able to apply numerical estimation, measurement, and calculation as appropriate to solve real-life problems. Scientific principles also are utilized throughout technology.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program:

• Requires students to have experience in the use of the scientific method as a problem-solving tool in technology.

• Requires students to have exposure to the scientific concepts underlying various systems including, but not limited to, mechanical, fluid, electrical, nuclear, solar, and thermal.

• Emphasizes the importance of quality assurance through the use of accurate measurement, appropriate tolerance, and other measurements of precision.

• Requires students to apply the knowledge and thinking skills of technology, mathematics, and science, to address real-life problems and make informed decisions.

• Requires students to have a wide exposure to various methods of problem-solving techniques such as estimation, best fit, dimensional analysis, and problem identification.

• Teaches and encourages the use of troubleshooting techniques in a variety of technical systems.

• Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 10

Design and Systems

Students will utilize research and design strategies appropriate to Industrial and Technology Education. They will incorporate these strategies (e.g. ideation, rough sketches, study model, final sketches, prototype development, prototype evaluation) as they relate to the universal system model (input, process, output, feedback).

Rationale for Standard 10

Knowledge of the design process and the universal system model, enables students to design change to achieve results. Although the design process is not linear, it is useful to separate the major steps required to understand the knowledge, skills, and thinking processes involved. By undertaking design projects, students gain a more comprehensive understanding of technology and the interrelationships among technological systems.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

• Students understand the universal system model (input, process, output, feedback).

• Students are familiar with the engineering design process (the design loop: identify needs, research and investigate, generate alternatives, model the solution, and testing and evaluation).

• Students understand the technological design process (define the problem, multiple solutions, select a solution, model a solution, analyze a solution, and communicate the solution).

• Students have opportunities to develop and test prototypes.

• Students create and use graphics in the design process in multiple forms of visual communication.

• Students understand the difference between the scientific method and the technological method of problem-solving and be able to apply both methods to technological and scientific problems.

• Students arrive at technical solutions to real-life problems using the technological method to manipulate processes, resources, basic tools, equipment, ideas, and materials.

• Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 11

Technology and Society

Students will demonstrate an awareness of historical, current, and future impacts of technology on society and the interrelationships among technology, individuals, and society.

Rationale for Standard 11

Technological development is a dynamic social force. Therefore educators must teach students to analyze and judge the effects of technology on society. Technology is seldom the only cause of change that one observes. Technologies are often seen as components, within a umbrella structure, that reshape the roles, relationships, and institutions which make up our ways of living together. Substantial technological innovations often promote and influence the experiences of people in their work and communities.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes, but is not limited to, the study of:

- Ethical considerations.

- Global and regional economic issues surrounding technology, such as how rapidly changing technology affects jobs.

- Environmental issues.

- Political and legal issues.

- The criteria for determining usage of appropriate technologies.

- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 12

Safety and Facilities Management

Each student in the program acquires knowledge of the planning and design of laboratory facilities and equipment layout. This requires the understanding of safety legislation as related to Industrial and Technology Education.

Students will acquire knowledge of and procedures for: handling, storage and disposal of toxic and hazardous substances, emergency/disaster preparedness, and personal and workplace safety, including eye protection, protective clothing, fire safety and safe use of tools, machines and equipment.

Rationale for Standard 12

Facility design is of paramount importance in providing a safe and well-planned environment. A variety of federal, state and local legislation focuses upon industrial safety, hazardous material handling and disposal. For industrial and technology instruction to be conducted in a safe and legally compliant manner, prospective teachers must be knowledgeable in safety and emergency procedures.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

• The program orients students to safety procedures that are needed before and during laboratory and field experiences.

• Students understand the proper storage of chemicals by compatibility categories, hazardous waste storage, and disposal procedures.

• Students are knowledgeable of safety legislation.

• Students are able to demonstrate their knowledge of the procedures for handling toxic substances, eye protection, protective clothing, fire safety, hazardous waste disposal.

• The student will receive information on Material Safety Data Sheets (MSDS), right-to-know, teacher liability and record keeping.

• Students are prepared to design and modify the environment to maximize learning.

• Students are prepared to design and modify the environment to meet learning goals and objectives.

• Students are able to distinguish between production efficiency and instruction efficiency in the design and lay-out of facilities.

• Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Standard 13

Field Experience

Students are involved in planned field experience in public school Industrial and Technology Education classes at one or more levels, kindergarten through grade twelve.

Rationale for Standard 13

Field experiences make collegiate learning more meaningful. Student discussions following the field experiences promote a better understanding of the discipline of Industrial and Technology Education. Early field experiences help students to determine whether teaching careers are suitable for them.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which the program includes:

- A variety of observations and experiences in Industrial and Technology Education classes, which include culturally diverse, at risk, and special needs students.

- Guided public school classroom observations and experiences that relate to course work in the program.

- Student participation in analytical discussions that compare their field experiences with those of other students in the program.

- Other qualities related to this standard that are brought to the reviewers' attention by the institution.

Category II: Essential Features of Program Quality

Standard 14

Coordination of the Program

The program is coordinated effectively by one or more persons who are responsible for program planning, implementation, and review.

Rationale for Standard 14

The accomplishments of students in a subject matter preparation program depend in part on the effective coordination of the program by responsible members of the institution's administrative staff and/or academic faculty. For students to become competent in the subjects they will teach, all aspects of their subject matter preparation must be planned thoughtfully, implemented conscientiously, and reviewed periodically by designated individuals.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- There is effective communication and coordination among the academic program faculty, and between the faculty and local school personnel, local community colleges, and the professional education faculty.

- One or more persons are responsible for overseeing and assuring the effectiveness of student advisement and assessment in the program (refer to Standards 15 and 16) and of program review and development by the institution (refer to Standard 17).

- The institution ensures that faculty who teach courses in the Industrial and Technology Education program have backgrounds of advanced study or professional experience and currency in the areas they teach.

- Sufficient time and resources are allocated for responsible faculty and/or staff members to coordinate all aspects of the program.

- The program has other qualities related to this standard that are brought to the reviewer's attention by the institution.

Standard 15

Student Advisement and Support

A comprehensive and effective system of advisement and support provides appropriate and timely program information and academic assistance to current and potential students, and gives attention to all students, including transfer students and members of groups that traditionally have been under-represented among teachers of Industrial and Technology Education.

Rationale for Standard 15

To become competent in a discipline of study, students must be informed of the institution's expectations, options, and requirements; must be advised of their own progress toward academic competence; and must receive information about sources of academic and personal assistance and counseling. Advisement and support of prospective teachers are critical to the effectiveness of subject matter preparation programs, particularly for transfer students and members of groups that traditionally have been underrepresented in the discipline. In an academic environment that encourages learning and personal development, prospective teachers acquire a student-centered outlook toward education that is essential for their subsequent success in public schools.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- Advisement and support in the program are provided by qualified individuals who are assigned those responsibilities, and who are available and attentive when the services are needed.

- Advisement services include information about course equivalencies, financial aid options, admission requirements in professional preparation programs, state certification requirements, field-experience placements, and career opportunities.

- Information about subject matter program purposes, options, and requirements is available to prospective students and distributed to enrolled students.

- The institution encourages students to consider careers in teaching, and attempts to identify and advise interested individuals in appropriate ways.

- The institution actively seeks to recruit and retain students who are members of groups that traditionally have been underrepresented in Industrial and Technology Education.

- The institution collaborates with community colleges to articulate academic course work and to facilitate the transfer of students into the subject matter program.

- The program has other qualities related to this standard that are brought to the reviewer's attention by the institution.

Standard 16

Assessment of Subject Matter Competence

The program uses multiple measures to assess the subject matter competence of each student formatively and summatively in relation to Standards 1 through 12. The scope and content of each student's assessment is congruent with the studies the student has completed in the program.

Rationale for Standard 16

An institution that offers content preparation for prospective teachers has a responsibility to verify their competence in the subject(s) to be taught. It is essential that the assessment in Industrial and Technology Education use multiple measures, have formative and summative components, and be as comprehensive as Standards 1 through 12. The content must be congruent with each student's core, breadth, and concentration studies in the program (see Preconditions 2 and 3 on page 16). Course grades and other course evaluations may be part of the summative assessment, but may not comprise it entirely.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- The assessment process examines each student's performance in Industrial and Technology Education, and includes student performances, projects and demonstrations in addition to written examinations based on criteria established by the institution.

- The assessment encompasses the content of Standards 1 through 12, and is congruent with each student's breadth and concentration studies in the program (as defined by the institution in response to Preconditions 2 and 3).

- The assessment process is valid, reliable, equitable, and fair, and includes provisions for student appeals.

- The assessment scope, process and criteria are clearly delineated and made available to students.

- The institution makes and retains thorough records regarding each student's performance in the assessment.

- The program has other qualities related to this standard that are brought to the reviewer's attention by the institution.

Standard 17

Program Review and Development

The Industrial and Technology Education program has a comprehensive, ongoing system of review and development that involves faculty, students and appropriate public school personnel, including Industrial and Technology Education teachers, and that leads to continuing improvements in the program.

Rationale for Standard 17

The continued quality and effectiveness of subject matter preparation depends on periodic reviews of and improvements to the programs. Program development and improvement should be based in part on the results of systematic, ongoing reviews that are designed for this purpose. Reviews should be thorough and should include multiple kinds of information from diverse sources.

Factors to Consider

When reviewers judge whether a program meets this standard, the Commission expects them to consider the extent to which:

- Systematic and periodic reviews of the subject matter program reexamine its philosophy, purpose, design, curriculum, and intended outcomes for students (consistent with Standard 1).

- Information is collected about the program's strengths, weaknesses, and needed improvements from participants in the program, including faculty, students, recent graduates, and employers of recent graduates, and from other appropriate public school personnel, including teachers of Industrial and Technology Education.

- Program development and review involves consultations among department that participate in the program (including the education and Industrial and Technology Education departments) and includes a review of recommendations by elementary, secondary, and community college educators.

- Program improvements are based on the results of periodic reviews, the implications of new developments in Industrial and Technology Education, the identified needs of program students and school districts in the region, and recent Industrial and Technology Education curriculum policies of the state.

- Assessments of students in the program (pursuant to standard 16) are also reviewed and used for improving the philosophy, design, and curriculum and/or outcome expectations of the program.

- The program has other qualities related to this standard that are brought to the reviewer's attention by the institution.

Specifications for the Assessment of Subject Matter Knowledge and Competence for Prospective Teachers of Industrial and Technology Education

Industrial and Technology Education
Teacher Preparation and Assessment Advisory Panel
California Commission on Teacher Credentialing
1996

A student who seeks to earn the Single Subject Teaching Credential in Industrial and Technology Education should have a basic knowledge of communication; production; power, energy, and transportation; and technology. The student should also be skillful at higher-order thinking skills such as analyzing and interpreting information; comparing, contrasting and synthesizing ideas; thinking critically; and drawing sound inferences and conclusions from information that is provided or widely known.

To verify that these expectations have been attained, the Commission's standardized assessment of industrial and technology education competence consists of two components: (1) a multiple-choice knowledge assessment and (2) a constructed-response performance assessment. For the two sections of the assessment, the Industrial and Technology Education Teacher Preparation and Assessment Advisory Panel drafted the following specifications of knowledge, skills, and abilities needed by teachers of industrial and technology education. Adopted by the Commission, these specifications illustrate the knowledge, skills, and abilities that students should acquire and develop in a subject matter program for future teachers of industrial and technology education.

Both the multiple-choice and constructed-response components of the assessment are based on the same content categories (see Section 1 below). Examinees are expected to have a command of the subject matter content that is typically studied in a discipline-based setting. In addition, they are expected to demonstrate an understanding of that content from an integrated and inter-disciplinary perspective.

Section 1: Knowledge of Industrial and Technology Education

Prospective teachers of industrial and technology education should have a command of knowledge in four areas, as follows, in order to pass the assessment of knowledge of industrial and technology education:

I.   Communication (30%)
II.   Production (23%)
III.   Power, Energy, and Transportation (20%)
IV.   Technology (27%)

I.   **Communication (30%)**

•   **Understand the composition and function of communication technology industries.**

Includes types of businesses; recent industry trends; career opportunities, their characteristics, and their requirements; major markets; and major material and service providers.

•   **Understand the appropriate selection and use of resources in communication technology.**

Includes appropriate tools, materials, and equipment for a given task; the use of selected tools and equipment in a given situation (e.g., computer-based page layout and design, audio, video, and multimedia productions, data storage and retrieval); properties of materials and supplies used in communication technology; and the selection of appropriate materials and supplies for a given application.

•   **Understand the principles, processes, and procedures in graphic arts and electronic publishing.**

Includes graphic design (e.g., layout, color, typography), image generation (e.g., scaling, photo imaging, image assembly), production (e.g., image carrier, image transfer), binding and finishing, and the use of computers in graphic arts.

•   **Understand the principles, processes, and procedures in design/drafting.**

Includes types of sketches and drawings and their uses; techniques and procedures for designing, producing, and interpreting technical drawings (e.g., mechanical, architectural); the production and interpretation of specifications and three-dimensional models; and the use of computers and computer software.

•   **Understand the principles, processes, and procedures in electronic communication.**

Includes basic electronics (e.g., characteristics and uses of electronic components, DC and AC circuits, analog and digital circuits, integrated circuits), processes and procedures related to electronic and telecommunication systems (e.g., television, telephone, on-line communication, satellite communication), the analysis of broadcast systems (e.g., operating parameters of broadcast systems, applying test procedures, determining appropriate systems and components for a given application), and the analysis of the capabilities of various technologies.

II.   Production (23%)

•   **Understand the composition and function of production technology industries.**

Includes types of businesses; recent industry trends; career opportunities, their characteristics, and their requirements; major markets; and major material and service providers.

•   **Understand the appropriate selection and use of resources used in production technology.**

Includes the selection and use of appropriate tools and equipment in a given manufacturing or constructing situation, the properties of materials used in production technology, and the selection of appropriate materials for a given application.

•   **Understand the principles, processes, and procedures in construction.**

Includes processes and procedures used to construct various types of structures, the importance of legal requirements associated with construction projects (e.g., regulatory agencies, zoning laws, building inspection services), purposes of construction documents such as permits and licenses, problems related to construction systems, and appropriate applications and modifications of processes and procedures.

•   **Understand the principles, processes, and procedures in manufacturing.**

Includes characteristics and types of manufacturing systems (e.g., automated, robotics, continuous, custom, intermittent, just-in-time), types and characteristics of manufacturing processes (e.g., casting, forming, separating, conditioning) and their capabilities, procedures for ensuring and maintaining quality control, procedures for managing manufacturing operations, and the management and financial impact of operational and line decisions.

III.   Power, Energy, and Transportation (20%)

•   **Understand the composition and function of power, energy, and transportation technology industries.**

Includes types of businesses; recent industry trends; career opportunities, their characteristics, and their requirements; major markets; and major material and service providers.

- **Understand resources used in power, energy, and transportation technologies.**

  Includes the selection and use of appropriate tools and equipment in a given situation (e.g., conversion, control, storage, and transmission of energy); properties of materials and supplies used in power, energy, and transportation technologies; and the selection of appropriate materials for a given application.

- **Understand generation, transformation, transmission, and control of energy.**

  Includes scientific principles, processes, and equipment involved in generating power (e.g., nuclear, fossil fuel, solar, hydro, wind); conversions among electrical, mechanical, chemical, and nuclear forms; the transmission, control, and storage of energy; and concepts of efficiency and energy loss.

- **Understand transportation technology.**

  Includes principles, processes, and equipment related to propulsion, suspension, guidance, control, support, and structural components of land, air, and sea transportation systems; technological problems related to transportation systems; and analysis of situations to determine appropriate applications and modifications of processes and procedures.

IV.   **Technology (27%)**

- **Understand career opportunities and industrial and technology career paths.**

  Includes characteristics of these careers (e.g., educational requirements, working conditions, responsibilities); the relationship between the characteristics of careers and the goals of individuals; preparation requirements for careers; skills for seeking employment; functions and resources of professional organizations; and the importance and development of social skills, leadership skills, and pride in the quality of one's work.

- **Understand environmental and safety issues related to resources used in industrial and technology education.**

  Includes procedures for the safe operation of tools and equipment, recognition of safety hazards and potentially dangerous situations, the importance of a safe and clean work environment in the laboratory and workplace, procedures and equipment for maintaining a safe and clean environment, procedures and issues related to environmentally sound disposal of materials, and the importance of personal safety and instruction of safety practices.

- **Understand independent and integrated systems.**

  Includes the systems approach (e.g., input, process, output, feedback), how technological systems operate individually and interdependently, interrelationships that commonly exist among technological systems (e.g., communication, energy, production), the critical role of evaluation and quality control in technological systems, and procedures for setting and meeting specifications.

- **Understand the principles, processes, and procedures in multimedia communication.**

  Includes capabilities of multimedia systems; procedures for interfacing various communication media; and the planning and designing of a multimedia communication product intended to teach, inform, or sell.

- **Understand new and emerging technologies.**

  Includes capabilities of new and emerging technologies (e.g., biotechnology, laser technology), scientific principles related to these technologies, sources of information concerning emerging technologies, and likely uses for these technologies.

- **Understand the interrelationships among technology, science, and mathematics.**

  Includes the flow of information among technology, science, and mathematics; the analysis of technological systems in terms of mathematical and scientific principles; and the influence of technology on science and mathematics.

- **Understand technology and society.**

  Includes current political, economic, and social trends and how they relate to industrial technology; ethical considerations; the role of business, government, society, and the individual in shaping the field of technology; and the history of technology and its significance in global, political, and social contexts.

- **Understand the interdisciplinary nature of technology education.**

  Includes the value of an integrated approach that uses knowledge of other academic subjects to help understand and solve technological problems (e.g., the use of effective language skills for the communication of ideas, the application of the principles of social systems to analyze the impact of technology and society on one another).

•   **Understand the principles, processes, and procedures in engineering technology.**

Includes the basic principles of design, technology, physics, chemistry, and electronics (e.g., dimensional analysis, force, Ohm's law) related to the solution of engineering problems; and basic mathematical procedures and processes (e.g., quadratic equations, graphing, trigonometric functions) related to the solution of engineering problems.

•   **Understand design and problem solving in technology.**

Includes procedures and processes in technological methods of problem solving, development of alternative solutions to a given problem, and critical-thinking processes in the evaluation of multiple solutions.

**Section 2:   Subject Matter Constructed-Response Assessment
in Industrial and Technology Education**

The second section of the standardized assessment of prospective teachers of Industrial and Technology Education consists of constructed-response assessments. Each assessment requires demonstration of one or more of the following abilities.

•   The ability to evaluate and/or interpret a given situation or case study related to industrial technology. Information will be provided in printed form (e.g., written descriptions, tables, graphs, maps, diagrams).

•   The ability to select and/or design appropriate methods and materials to meet specified goals in industrial technology-related contexts.

•   The ability to explain and justify evaluations, interpretations, selections, and designs using appropriate information from the field of industrial technology and related fields (e.g., physical sciences, business).

The problems posed in this section of the assessment will primarily address the topics and concepts outlined in the final (Technology) section of the test specifications and will require broad-based knowledge of the subject matter. Examples of the types of problems that might be included on the test are as follows:

•   Analyzing the potential uses of technology as a solution to a given workplace problem (e.g., frequent workplace injury, need for increased productivity).

•   Evaluating the potential impact of a given type of technology on society and the effect of societal factors on the development and application of the technology.

Part 3

Implementation of

Industrial and Technology Education

Teaching Standards

Implementation of Program Quality Standards
for Subject Matter Preparation in
Industrial and Technology Education

The Program Quality Standards for Subject Matter Preparation in Industrial and Technology Education are part of a broad shift in the policies of the California Commission on Teacher Credentialing related to the preparation of professional teachers and other educators in California colleges and universities. The Commission initiated this broad policy change to foster greater excellence in educator preparation and to combine flexibility with accountability for institutions that educate prospective teachers. The success of this reform depends on the effective *implementation* of program quality standards for each credential.

Pages 47 through 50 of the handbook provide general information about the transition to program quality standards for all teaching credentials. Then the handbook offers detailed information about implementing the industrial and technology education standards (pages 51 through 59).

Transition to Quality Standards for All Teaching Credentials

The Commission is gradually developing and implementing Standards of Program Quality and Effectiveness for all teaching credentials. The overall purpose of the standards is to provide the strongest possible assurance that future teachers will have the expertise and abilities they will need for their critically important roles and responsibilities. Among the most significant areas of knowledge and abilities for teaching are those associated with the subjects of the school curriculum.

The Commission began to develop new standards for the subject matter preparation of teachers in 1986. In that year, the Commission appointed an expert advisory panel in elementary education, which developed *Standards of Program Quality for the Subject Matter Preparation of Elementary Teachers.* Following an extensive process of consultation with elementary educators, the Commission adopted the subject matter program standards for the Multiple Subject Teaching Credential. The standards have now been implemented in 58 colleges and universities, which offer a total of 66 programs.

In 1989, the Commission established expert subject matter advisory panels to develop standards for the subject matter preparation of prospective secondary teachers in English, mathematics, science, and social science. The panels consisted of K-12 teachers of the subjects, public school curriculum specialists, university professors of the subjects, and other subject matter experts in California. Following extensive consultation with colleges, universities, professional organizations, and local and state education agencies, the Commission adopted the standards in 1992. In a similar manner, in 1991 the Commission established expert panels to develop subject matter standards in art, music, physical education, and languages other than English. These standards were adopted by the Commission in 1994.

In January of 1995, the Commission appointed advisory panels to develop program standards in agriculture, business education, health education, home economics, and industrial and technology education. Initial drafts of standards in these subjects were distributed widely for discussion and comment before they were completed by the panels and adopted by the Commission on February 2, 1996.

Improvements in the Review of Subject Matter Programs

The last occasion on which the Commission reviewed subject matter programs in industrial and technology education was 1983. There are relatively few similarities between (a) the program guidelines and review procedures that were used in 1983 and (b) the Commission's plan for implementing the new standards in this handbook. In reviewing programs according to the new standards, several major improvements are anticipated.

(1)   The standards are *much broader* than the prior guidelines for subject matter programs. The standards provide considerably *more flexibility to institutions.*

(2)   As a set, the standards are *more comprehensive* in addressing the *quality* of subject matter preparation. They provide a stronger assurance of excellent preparation.

(3)   The new Program Review Panels will conduct *more intensive reviews* that will focus on *program quality issues* rather than course titles and unit counts.

(4)   The new panels will have *more extensive training* because the standards require that they exercise more professional discretion about the *quality* of programs.

(5)   Institutional representatives will have opportunities to meet with the Review Panels to discuss questions about programs and standards. Improved communications should lead to better decisions about program quality.

Alignment of Program Standards and Performance Assessments

The Teacher Preparation and Licensing Act of 1970 established the requirement that candidates for teaching credentials verify their competence in the subjects they intend to teach. Candidates for teaching credentials may satisfy the subject matter requirement by completing approved subject matter programs or by passing subject matter assessments that have been adopted by the Commission. The Commission is concerned that the scope and content of the subject matter assessments be aligned and congruent with the program quality standards in each subject.

To achieve this alignment and congruence in industrial and technology education, the Commission asked the Industrial and Technology Education Advisory Panel to develop subject matter assessment specifications that would be consistent in scope and content with the program quality standards in this handbook. Following extensive discussion and review by subject matter experts throughout the state, the Commission adopted a detailed set of *Specifications for the Assessment of Subject Matter Knowledge and Competence of Prospective Teachers of Industrial and Technology Education*. These specifications, which are included in this handbook (pages 39 through 44), are the basis for the new subject matter assessment in industrial and technology education being developed by National Evaluation Systems, Inc.

The Commission is pleased that the *Specifications* for subject matter assessments are as parallel as possible with the scope, content and rigor of the standards for subject matter programs. To strengthen the alignment between subject matter assessments and programs, college and university faculty and administrators are urged to examine the *Specifications* as a source of information about knowledge, abilities and perspectives that are important to include in subject matter programs for teachers of industrial and technology education.

Validity and Authenticity of Subject Matter Assessments

The Commission is also concerned that the subject matter assessments of prospective teachers address the full range of knowledge, skills, and abilities needed by teachers of each subject. For fifteen years the Commission relied on subject matter examinations that consisted entirely of multiple-choice questions. In 1987-88, the Commission evaluated fifteen of these subject matter exams comprehensively. More than 400 teachers, curriculum specialists, and university faculty examined the specifications of these tests, as well as the actual test questions. An analysis of the reviewers' aggregated judgments showed that (1) particular changes were needed in each multiple-choice test and (2) each multiple-choice test should be supplemented by a *performance assessment* in the subject.

Since 1988, the Commission's subject matter advisory panels have created performance assessments for each of ten Single Subject Credentials. In most cases, these performance assessments consist of constructed-response problems or tasks, to which examinees construct complex responses instead of selecting an answer among four given choices. Examinees' responses are scored on the basis of specific criteria that were created by the advisory panels and are administered by subject specialists who are trained in the scoring process. Candidates for the ten Single Subject Credentials must pass the performance assessment as well as a multiple-choice test of their subject matter knowledge, unless they complete an approved subject matter program. Meanwhile, for the Multiple Subject Credential, the Commission developed and adopted the *Multiple Subjects Assessment for Teachers (MSAT)* that consists of a multiple-choice (*Content Knowledge*) section, and a constructed-response *(Content Area Exercises)* section. By developing and adopting these assessments, the Commission has committed itself to assessing the subject matter knowledge and competence of prospective teachers as validly and comprehensively as possible. Likewise, the new examinations in agriculture, business, health science, home economics, and industrial and technology education developed by National Evaluation Systems, Inc. (NES) will include constructed-response components.

New Terminology for "Waiver Programs"

In 1970, the legislature clearly regarded the successful passage of an adopted examination as the principal way to meet the subject matter requirement. However, the 1970 law also allowed candidates to complete Commission-approved subject matter programs to "waive" the examinations. Because of this terminology in the 1970 statute, subject matter programs have commonly been called *waiver programs* throughout the state.

In reality, the law established two alternative ways for prospective teachers to meet the subject matter requirement. An individual who completes an approved subject matter program is not required to pass the subject matter examination, and an individual who achieves a passing score on an adopted exam is not required to complete a subject matter program. Overall, the two options are used by approximately equal numbers of candidates for initial teaching credentials. Subject matter programs are completed by more than half of the candidates for Single Subject Credentials, but the adopted examination is the preferred route for more than half of all Multiple Subject Credential candidates.

Because of the significant efforts of the Commission and its expert advisory panels, subject matter programs and examinations are being made as parallel and equivalent to each other as possible. The term *waiver programs* does not accurately describe a group of programs that are alternatives to subject matter examinations. For this reason, the Commission uses the term *subject matter programs* instead of *waiver programs,* which is now out of date.

Ongoing Review and Approval of Subject Matter Programs

After the Commission approves subject matter programs on the basis of quality standards, the programs will be reviewed at six-year intervals, in approximately the same way as the Commission reviews professional preparation programs in California colleges and universities. Periodic reviews will be based on the Standards of Program Quality and Effectiveness. Like professional preparation programs, subject matter programs will be reviewed on-site by small teams of trained reviewers. Reviewers will obtain information about program quality from institutional documents and interviews with program faculty, administrators, students, and recent graduates. Prior to a review, the Commission will provide detailed information about the scope, methodology and potential benefits of the review, as well as other implications for the institution.

Review and Improvement of Subject Matter Standards

Beginning in 2000-2001, the Commission will begin a cycle of review and reconsideration of the *Standards of Quality and Effectiveness for Subject Matter Programs in Industrial and Technology Education* and other subjects. The standards will be reviewed and reconsidered in relation to changes in academic disciplines, school curricula, and the backgrounds and needs of California students (K-12). Reviews of program standards will be based on the advice of subject matter teachers, professors and curriculum specialists. Prior to each review, the Commission will invite interested individuals and organizations to participate in it. If the Commission modifies the industrial and technology education standards, an amended handbook will be forwarded to each institution with an approved program.

Industrial and Technology Education Teacher Preparation:
Commission Timeline for Implementation of Standards

Dates	Steps in the Implementation of Standards
1996	The Commission adopts the Standards of Program Quality and Effectiveness that are on pages 17 through 38 of this handbook. The Preconditions on page 16 are also adopted.
July-October 1997	The Executive Director disseminates the handbook. The Commission's staff conducts regional workshops to answer questions, provide information, and assist colleges and universities.
November 1997 - February 1998	The Commission selects, orients and trains a Program Review Panel in Industrial and Technology Education. After March 1, 1998, these qualified content experts begin to review programs in relation to the standards.
March 1, 1998	Review and approval of programs under the new standards begins. No new subject matter programs in industrial and technology education will be reviewed in relation to the Commission's "old" guidelines of 1982.
1998-1999	Institutions may submit programs for preliminary or formal review on or after March 1, 1998. Once a "new" program is approved, all students who were not previously enrolled in the "old" program (i.e., all new students) should enroll in the new program. Students may complete an old program if they enrolled in it either (1) prior to the commencement of the new program at their campus, or (2) prior to September 1, 1999, whichever occurs first.
September 1, 1999	"Old" programs that are based on the 1983 guidelines must be superseded by new approved programs. After September 1, 1999, no new students should enroll in an old program, even if a new program in industrial and technology education is not yet available at the institution.
1999-2000 2000-2001	The Commission continues to review program proposals based on the standards and preconditions in this handbook.
September 1, 2002	The final date for candidates to complete subject matter preparation programs that were approved under the 1983 guidelines. To qualify for credentials based on an "old" program, students must (1) have entered that program prior to either (a) the implementation of a new program at their institution, or (b) September 1, 1999, whichever occurred first, and they must (2) complete the old program by September 1, 2002. Students who do not do so may qualify for credentials by passing the Commission's adopted examinations.

Implementation Timeline: Implications for Prospective Teachers

Based on the implementation plan that has been adopted by the Commission (prior page), candidates for Single Subject Credentials in Industrial and Technology Education who do not plan to pass the Commission-adopted subject matter examinations should enroll as early as feasible in subject matter programs that fulfill the standards in this handbook. After a "new" program begins at an institution, no students should enroll for the first time in an "old" program (i.e. one approved under the Commission's "old" guidelines of 1983).

Candidates who enrolled in programs that were approved on the basis of the "old" guidelines ("old" programs) may complete those programs provided that (1) they entered the old programs either before new programs were available at their institutions, or before September 1, 1999, whichever comes first, *and* (2) they complete the old programs before September 1, 2002.

Regardless of the date when new programs are implemented at an institution, no new students should enroll in an old program after September 1, 1999, even if a new program is not yet available at the institution. These students may qualify for Single Subject Teaching Credentials by passing the subject matter examinations that have been adopted for that purpose by the Commission.

Ordinarily, students are not formally "admitted" to a subject matter program on a specified date. Rather, students begin a subject matter program when they initially enroll in courses that are part of the program. The Commission offers the following clarification of the timeline on the prior page.

(1)   Students who have completed one or more courses in an old subject matter program by September 1, 1999, may complete that program and be recommended for a credential provided that these students also complete all requirements for the subject matter program (not necessarily the credential) by September 1, 2002.

(2)   Students who have not completed any courses in an old program by September 1, 1999, should be advised that after that date they should not take courses that are part of the old program (unless those courses are also a part of a new program). Instead, they should enroll in courses that are part of the new program. In many cases, the two programs will have some courses in common.

(3)   It may be necessary for some students to enroll in "new program courses" prior to the approval of the new program. Institutions may recommend these students for Single Subject Teaching Credentials even if the students have completed part of a new program prior to Commission approval of that program.

Once the Commission approves a new subject matter program, students who have already taken courses that are part of that program may continue to take courses in the program and complete the program even though they started taking courses before the program was approved by the Commission. Because of the flexibility of this policy, institutions should not expect to see any change in the September 1, 1999 date for the implementation of subject matter programs under the standards in this handbook.

Implementation Timeline Diagram

March 1998

Colleges and universities may begin to present program proposals for review by the Commission's Subject Matter Program Review Panel.

1998-1999

Once a program is approved under the standards, students who were not previously enrolled in the old program should enroll in the new program.

September 1, 1999

After this date, no new students should enroll in an old program, even if a new program in industrial and technology education is not yet available at the institution.

1999-2001

The Commission will continue to review program proposals. Prior to the approval of new programs, students may enroll in "new program courses" that meet the standards.

September 1, 2002

Final date for candidates to complete subject matter programs that were approved under the Commission's old guidelines (adopted in 1983).

Implementation Handbook:
Review and Approval of Subject Matter Programs in
Industrial and Technology Education

A regionally accredited institution of postsecondary education that would like to offer (or continue to offer) a Program of Subject Matter Preparation for the Single Subject Credential in Industrial and Technology Education may present a program proposal that responds to the standards and preconditions in this handbook. The submission of programs for review and approval is voluntary for colleges and universities; candidates can qualify for the Single Subject Credential by passing a standardized assessment of their industrial and technology education knowledge and competence.

For a subject matter program in industrial and technology education to be approved by the Commission, it must satisfy the preconditions and standards in this handbook. If an institution would like to offer two or more distinct programs of subject matter preparation in industrial and technology education, a separate proposal should be forwarded to the Commission for each program. For example, one program in industrial and technology education might have a concentration in communication technology, while a second program at the same institution could have concentration in production technology.

The Commission is prepared to review subject matter program proposals beginning on March 1, 1998. Prior to that date, the Commission's professional staff is available to consult with institutional representatives, and to do preliminary reviews of draft proposals (see page 55 for details).

Initial Statement of Institutional Intent

To assist the Commission in planning and scheduling reviews of program proposals, each institution is asked to file a Statement of Intent at least four months prior to submitting a proposal. Having received a timely Statement of Intent, the Commission will make every effort to review a proposal expeditiously. In the absence of a timely statement, the review process will take longer.

The Statement of Intent should be signed by the individual with chief responsibility for academic programs at the institution. It should provide the following information:

- The subject for which approval is being requested (industrial and technology education).

- The contact person responsible for each program (include phone number).

- The expected date when students would initially "enroll" in each program.

- An indication as to whether or not the institution expects to submit a program for "informal" review (defined below).

- The date when each program will be submitted for formal review and approval.

If an institution plans to submit proposals for two or more programs in industrial and technology education, the Statement of Intent should include this essential information for each program, and should indicate whether or not the programs will have distinct emphases.

The Program Proposal Document

For each program, the institution should prepare a program proposal that includes a narrative response to each precondition and standard on pages 16 through 38. Please provide six (6) copies of each program document.

Preconditions. A narrative section of the proposal should explain how the program will meet each precondition on page 16. In responding to the preconditions, the document must show the title and unit value of each required and elective course in the basic core component of the program (Precondition 2) and the same information about each course in the breadth and perspective component (Precondition 3). The proposal must also include brief course (catalog) descriptions of all required and elective courses.

Standards. In the major part of the program document, the institution should respond to each Standard of Program Quality and Effectiveness on pages 17 through 38. It is important to respond to each element of a standard, but a lengthy, detailed description is not necessary. Examples of how particular elements of the standard are accomplished are particularly useful. An institution's program proposal should include syllabi of required and selected elective courses, along with other supporting documentation to serve as "back-up" information to substantiate the responses to particular standards.

Factors to Consider. A program proposal must show how the program will meet each standard. The purpose of factors to consider is to amplify specific aspects of standards, and to assist institutions in responding to all elements of a standard. The Commission considers the factors to be important aspects of program quality, but it is not essential that the document respond to every factor. The factors are *not "mini-standards,"* and there is *no expectation* that a program must meet all the factors in order to fulfill a standard. (For added information about factors to consider, please see pages 6 and 15.)

Institutions are urged to *reflect on* the factors to consider, which may or may not be used as the "organizers" or "headings" for responding to a standard. Institutions are also encouraged to describe all aspects of the program's quality, and not limit their responses to the adopted factors in this handbook. The quality of a proposal may be enhanced by information about "additional factors" that are related to the standards but do not coincide with any of the adopted factors.

Steps in the Review of Programs

The Commission is committed to conducting a program review process that is objective, authoritative and comprehensive. The agency also seeks to be as helpful as possible to colleges and universities throughout the review process.

Preliminary Staff Review. Before submitting program proposals for formal review and approval, institutions are encouraged to request preliminary reviews of *draft* documents by the Commission's professional staff. The purpose of these reviews is to assist institutions in developing programs that are consistent with the intent and scope of the standards, and that will be clear and meaningful to the external reviewers. Program documents may be submitted for preliminary staff review at any time; the optimum time is at least one month after submitting the Statement of Intent and at least two months prior to the expected date for submitting a completed proposal. Preliminary review is voluntary; its purpose is to assist institutions in preparing program documents that can be reviewed most expeditiously in the formal review process.

Review of Preconditions. An institution's response to the preconditions is reviewed by the Commission's professional staff because the preconditions are based on state laws and regulations, and do not involve issues of program quality. If the staff determines that the program complies with the requirements of state laws and administrative regulations, the program is eligible for a quality review (based on the standards) by a panel of subject matter experts. If the program does not comply with the preconditions, the staff returns the proposal to the institution with specific information about the lack of compliance. Such a proposal may be resubmitted once the compliance issues have been resolved. In a few circumstances, the staff may seek the advice of the Subject Matter Program Review Panel concerning the appropriateness of proposed coursework to meet a particular precondition.

Review of Program Quality Standards. Unlike the preconditions, the standards address issues of program quality and effectiveness, so each institution's response to the standards is reviewed by a small Program Review Panel of subject matter experts. During the review process, there is an opportunity for institutional representatives to meet with the panel to answer questions or clarify issues that may arise. Prior to such a discussion, the panel will be asked to provide a preliminary written statement of the questions, issues or concerns to be discussed with the institutional representative(s).

If the Program Review Panel determines that a proposed program fulfills the standards, the Commission's staff recommends the program for approval by the Commission during a public meeting no more than eight weeks after the panel's decision.

If the Program Review Panel determines that the program does not meet the standards, the document is returned to the institution with an explanation of the panel's findings. Specific reasons for the panel's decision are communicated to the institution. If the panel has substantive concerns about one or more aspects of program quality, representatives of the institution can obtain information and assistance from the Commission staff. With the staff's prior authorization, the college or university may also obtain information and assistance from one or more designated members of the panel. After changes have been made in the program, the proposal may be resubmitted to the Commission's staff for reconsideration by the panel.

If the Program Review Panel determines that minor or technical changes should be made in a program, the responsibility for reviewing the resubmitted proposal rests with the Commission's professional staff, which presents the *revised* program to the Commission for approval without further review by the panel.

Appeal of an Adverse Decision. An institution that would like to appeal a decision of the staff (regarding preconditions) or the Program Review Panel (regarding standards) may do so by submitting the appeal to the Executive Director of the Commission. The institution should include the following information in the appeal:

- The original program proposal, and the stated reasons of the Commission's staff or the review panel for not recommending approval of the program.

- A specific response by the institution to the initial denial, including a copy of the resubmitted document (if it has been resubmitted).

- A rationale for the appeal by the institution.

The Executive Director may deny the appeal, or appoint an independent review panel, or present the appeal directly to the Commission for consideration.

Responses to Six Common Standards

The Commission adopted six standards for programs in *all* single subject disciplines.

Standard 1	-	Program Philosophy and Purpose
Standard 4	-	Diversity and Equity in the Program
Standard 14	-	Coordination of the Program
Standard 15	-	Student Advisement and Support
Standard 16	-	Assessment of Subject Matter Competence
Standard 17	-	Program Review and Development

These six standards are referred to as common standards because they are essentially the same in all subject areas.

An institution's program proposal in industrial and technology education should include subject-specific responses to Standards 1 and 4, along with subject-specific responses to the other curriculum standards in Category I (see pages 17 through 34). An institution's program proposal in industrial and technology education *may* also include a unique response to Standards 14, 15, 16 and 17. Alternatively, the institution *may* submit a "generic response" to these four common standards. In a generic response, the institution should describe how subject matter programs in all subjects will meet the four standards. A generic response should include sufficient information to enable an interdisciplinary panel of reviewers to determine that the four common standards are met in each subject area. Once the institution's generic response is approved, it would not be necessary to respond to the four standards in the institution's program proposal in industrial and technology education, or in any other subject.

Selection, Composition and Training of Program Review Panels

Review panel members are selected because of their expertise in industrial and technology education, and their knowledge of industrial and technology education curriculum and instruction in the public schools of California. Reviewers are selected from institutions of higher education, school districts, county offices of education, organizations of industrial and technology education experts, and other professional organizations. Members are selected according to the Commission's adopted policies that govern the selection of panels. Members of the Commission's Teacher Preparation and Assessment Advisory Panels may be selected to serve on Program Review Panels.

In industrial and technology education, each program proposal is reviewed by at least one professor of industrial and technology education, at least one secondary school teacher of industrial and technology education, and a third Review Panel member who is either another professor, or another teacher, or a curriculum specialist in industrial and technology education.

The Program Review Panel is trained by the Commission's staff. Training includes:

- The purpose and function of subject matter preparation programs.
- The Commission's legal responsibilities in program review and approval.
- The role of the review panel in making program determinations.
- The role of the Commission's professional staff in assisting the panel.
- A thorough analysis and discussion of each standard and rationale.
- Alternative ways in which the standard could be met.
- An overview of review panel procedures.
- Simulated practice in reviewing programs.
- How to write program review panel reports.

The training also includes analysis of the Common Standards. The reviewers of industrial and technology education programs are trained specifically in the consistent application of the subject-specific standards in industrial and technology education.

Subject Matter Program Review Panel Procedures

The Subject Matter Program Review Panel meets periodically to review programs that have been submitted to the Commission during a given time period. Whenever possible, Review Panels in more than one subject meet at the same time and location. This enables institutional representatives to meet with reviewers in more than one subject area, if necessary.

Review Panel meetings usually take place over three days. Meetings typically adhere to the following general schedule:

- First Day - Review institutional responses to common standards. Preliminary discussion of responses to curriculum standards.

- Second Day - Thorough analysis of responses to curriculum standards. Prepare preliminary written findings for each program, and FAX these to institutions.

- Third Day - Meet with representatives of institutions to clarify program information, discuss preliminary findings and identify possible changes in programs. Prepare written reports that reflect the discussions with institutions.

Subject Matter Program Review Panel Reports

Normally, the Review Panel's written report is mailed to the institution within two weeks after the panel meeting. If the report is affirmative, the Commission's staff presents the report to the Commission during a public meeting no more than eight weeks after the panel's decision.

If the Review Panel report indicates that the program does not meet the standards, specific reasons for the panel's decision are included in the report. The institution should first discuss such a report with the Commission's staff. One or more designated members of the panel may also be contacted, but only after such contacts are authorized by the staff.

If the report shows that minor or technical changes are needed in a program, the Review Panel gives responsibility for reviewing the resubmitted proposal to the staff.